FLIGHT

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"FLIGHT" PHOTOGRAPHS.

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For Sizes and Prices, see Advert., page xxiv.

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list :—

1927

May 19 .... **Aero Golfing Soc. (FLIGHT Cup), Addington.**
May 19 .... **The Royal Tournament, Olympia**
May 23 .... **"Steels for Aircraft," Sir Robert Hadfield, Bart., before Inst.Ae.E.**
May 25 .... **Inst.Ae.E. Visit to the National Physical Laboratory, Teddington, Middlesex.**
June 4–16 .... **Fourth International Aero Exhibition, Prague.**
June 18 .... **Inst.Ae.S. Visit to Croydon Aerodrome.**
July 2 .... **Royal Air Force Display.**

EDITORIAL COMMENT.

FOR the first time in the history of the Royal Aeronautical Society of Great Britain the Wilbur Wright Memorial Lecture was given, on May 16, by a lecturer from other than Anglo-American circles. The honour of giving the first non-English and non-American Wilbur Wright lecture fell to Dr. Prandtl, of the Göttingen University of Berlin, and indeed it would have been difficult to find a man with greater claims to this honour. The work of Prof. Prandtl on modern aerodynamic theory is now known and recognised all over the civilised world, and there is some cause for satisfaction in the fact that the modern aerofoil theory is frequently referred to as the "Lanchester-Prandtl Theory," even if it has, at the same time, to be admitted that scientific circles in Great Britain failed to appreciate the early work of Lanchester, so that it remained for Dr. Prandtl to carry out the work of elaborating and perfecting what was independently started by Mr. Lanchester.

R.Ae.Soc. Milestone

In the introduction to his Wilbur Wright lecture, Prof. Prandtl referred to the early history of the modern aerofoil theory, and pointed out that, although it was often taken for granted that he had found in Lanchester's early work the ideas upon which the theory was built up, this was not so, as the necessary ideas upon which to build up the theory had already occurred to him before seeing Lanchester's book. What had really happened was that Lanchester's treatment was difficult to follow, making a considerable demand on the reader's intuitive perception, and only because they had in Germany been working along similar lines were they able at once to grasp Lanchester's meaning.

Concerning later works by Lanchester, Dr. Prandtl made the interesting statement that "The Flying Machine" and "The Aerofoil and the Screw Propeller," published in 1915, remained unknown to the Germans until 1926. In these works Lanchester came to the same conclusions regarding induced drag as those reached independently by German workers.

On the occasion of the reading of the Wilbur Wright

Memorial Lecture, the Chairman of the Royal Aeronautical Society, Col. the Master of Sempill, presented to Dr. Prandtl the Society's Gold Medal, the highest distinction which the R.Ae.S. has to bestow. Again, there will probably be few who are not in entire agreement with the Council of the Royal Aeronautical Society, and it is to be hoped that this year's Wilbur Wright Memorial Lecture by, and the presentation of the Society's gold medal to, Dr. Prandtl will mark the beginning of a much closer co-operation between German and English aerodynamic experts than has obtained in the past. The language difficulty, no doubt, has had much to do with the limited extent to which workers in the two countries have been able to follow one another's methods and results, but Dr. Prandtl provided a splendid example of what can be done to break down such barriers by study. He commenced to learn English after receiving the invitation to read the Wilbur Wright lecture, and although it cannot be claimed that he spoke fluently, it was very evident that the reading of English presented few difficulties to him. Perhaps it is too much to hope that our leading experts in aerodynamics will set to work and study German, but, at least, it should be possible to ensure, by careful study of all German literature on the subject, that German work is more closely followed in the future than it has been in the past. Maj. A. R. Low, we believe, translated Prof. Prandtl's paper, and read the greater portion of it at the lecture. As Maj. Low has a thorough knowledge of aerodynamics, might it not be possible to appoint him "Aerodynamics Liaison Officer" between German and British aerodynamics institutions?

If the presentation of the R.Ae.S. Gold Medal to Dr. Prandtl was popular, the award of the Society's Silver Medal to Prof. B. Melvill Jones, of Cambridge University, was no less so. This medal is awarded for the best paper of the session, and was awarded for Professor Jones's paper on control at stalling angle. This subject is a controversial one, but one of the greatest importance, and the excellent work done by Prof. Jones receives but a well merited recognition.

◆ ◆ ◆

The H.A.P. The first Hampshire Air Pageant, held at the Hamble aerodrome on Sunday last, was a qualified success. In fact, it was from some points of view so successful as to be not quite a success. The initial programme was somewhat ambitious, and the entries list was such as could scarcely have been foreseen when the meeting was first contemplated. With more than 20 machines in a single race, and with events other than racing interposed between races, there was obviously no time for running the races in heats, as would otherwise have been the course to follow. Under the circumstances, therefore, it can only be regarded as little short of marvellous that the meeting passed off without a single mishap to mar the proceedings. The Hamble aerodrome is not a *very* large one to begin with, and by the time a corner has been lopped off for enclosures and another for the aeroplane park (in this case accommodating some 60 machines) there really is not a vast space left, and landing, with a number of machines flying about, becomes a matter of some skill.

In theory the programme arrangement was excellent and would have been difficult to improve upon. In actual practice, however, it seemed that the services of men with considerable experience in air-racing should be secured to a much greater extent than was the case. For instance, the lining up of machines for the races, in their order of starting, was greatly handicapped by lack of officials entrusted with full authority, and some confusion was the inevitable result. The fact that, owing to the numerous starters, machines had to be lined up in two rows did not make matters easier, and although effective, the system of scaring away people who have got in front, by starting machines into the middle of them, is not one to be recommended.

Again, owing to the noise of machines passing in front and overhead drowning the sound of the loud speakers, the handicap allowances were more often than not impossible to ascertain. The same applied to a considerable extent to the Bournemouth Easter Meeting, and it begins to look as if it will become necessary to have a scoring board upon which the handicaps of all competitors can be displayed so that people who have for one reason or another missed the announcement may there look up the figures. If the handicap allowances could be worked out some time beforehand and printed in the programmes, so much the better. The argument against this is that in the case of a strong wind on the day of the race, slow machines are affected to a greater extent than fast machines. Taking an average from a number of meetings would probably show, however, that this objection is more serious in theory than in practice. As it was, the handicapping at Hamble was good, and the finishes were remarkably close.

The various displays and events other than races were excellent, and confirmed the view we have long held, that the monotony of air racing should be relieved by varied events. Presumably, it is now too late to arrange this for the Bournemouth Whitsun meeting, but for subsequent air race meetings something of a diversion should be included in the programme. Taken all around, the H.A.P. was encouraging. The attendance was all that could have been hoped for, and with a little more practical experience the Club should be able to organise some really outstanding meetings.

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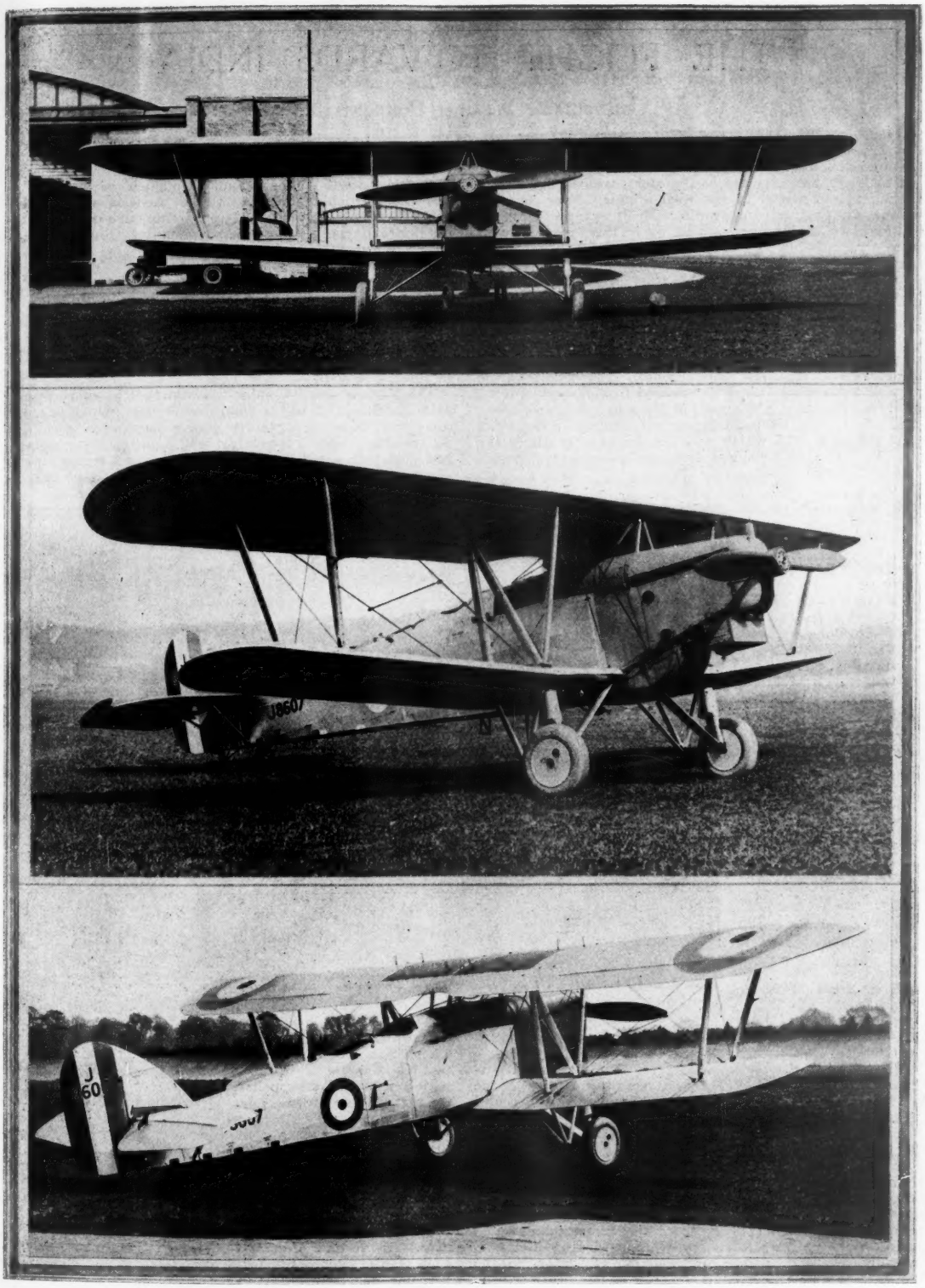
The Royal Tournament Special interest attaches to the Royal Tournament at Olympia this year on account of the fact that it is now 50 years since the tournament was instituted, and that consequently, a programme has been arranged worthy of a jubilee celebration. The tournament, which will be opened by the King and Queen today, May 19, will be open daily until June 4, and as it is held on behalf of the charities of the Royal Navy, Army and Air Force, it has a very special demand upon our time and purse, quite apart from the fact that the tournament is in itself a show, the like of which cannot be seen anywhere else on earth. The Royal Air Force will be represented, in addition to the detachment taking part in the opening ceremony with colours and bands, and which will be inspected by His Majesty the King, by demonstrations of physical training. All who saw them in the Stadium at Wembley will know that the R.A.F. is something out of the ordinary, and always well worth watching (although its own particular display at Hendon does not take place until July 2), and any who can possibly do so, should make a point of visiting Olympia during this year's Tournament.



["FLIGHT" *Photographs*

THE FLIGHT TOWARDS INDIA : These three views show the Hawker "Horsley" with Rolls-Royce "Condor" engine on which Lieuts. Carr and Gillman are attempting a non-stop flight from England to India. The machine, it will be seen, has undergone remarkably small external changes, and is to outward appearances almost identical with the standard service type of machine in use by the R.A.F. To have managed to stow some 1,100 gallons of petrol into the machine without spoiling its remarkably clean lines is something of an achievement.

THE FLIGHT TOWARDS INDIA

Unfavourable Weather Postpones Start

IN accordance with the expressed wishes of the authorities that no publicity should be given to the proposed flight from England to India before the start, we refrained from referring to the matter in last week's issue. Now that the machine is at Cranwell aerodrome, with Press representatives in attendance, and reports appearing in the Press daily, it becomes permissible to give a few particulars.

As all our readers are probably aware by now, the intention is to attempt a non-stop flight from England to India, beating, if possible, the existing world's record established by Costes and Rignot on a Breguet machine by flying from Paris to Jask, on the Persian Gulf, a distance of 5,396 kms. (3,350 miles). If all goes well, the British machine should get as far as Karachi, thus beating the French flight by a wide margin at each end of the route. The distance from Cranwell aerodrome, Lincs (from which the start will be made), to Karachi is 3,900 miles (6,280 kms.) measured along a great-circle line, although the actual distance of the route to be followed, and which will not be exactly along the great-circle line, is considerably more, somewhere between 4,200 and 4,300 miles. In case of success the British flight will be credited with the great-circle distance only.

The two aviators who are attempting the flight are Flight-Lieut. Charles R. Carr, D.F.C., on Air Staff Duties in the Air Defence of Great Britain Command, Uxbridge, and Flight-Lieut. Leonard E. M. Gillman, on Air Staff (Navigation) Duties in the same Command. Lieut. Carr will be chief pilot, while Lieut. Gillman will be navigator and second pilot. Lieut. Carr has had a great deal of experience in piloting a variety of machines, and has in addition the advantage of having taken part in work which does not usually fall to the lot of an average pilot, having been a member of the Shackleton Antarctic Expedition, which carried an Avro-Baby seaplane. Flight-Lieut. Gillman is generally regarded as one of the finest navigators in the R.A.F., and was a member of the crew of one of the Fairey machines which made the flight from Cairo to the Cape, back to Cairo, and on to England. He has thus had experience of air navigation under all sorts of conditions, and is peculiarly qualified for his task. Indeed, it would have been difficult to find two men better suited to this difficult undertaking.

The machine to be used in the attempt is a Hawker "Horsley" bomber, with Rolls-Royce "Condor" engine. The "Horsley" is the standard bomber of the R.A.F., and the particular machine to be used on the flight is perfectly standard in outward appearance, although naturally the internal arrangement differs a good deal from the normal owing to the fitting of large petrol tanks. The alteration does not, however, extend to the structure of the machine, which is standard in every respect except for the undercarriage, which has had to be strengthened to take the extra weight. Detailed data relating to the "Horsley" may not be published at the moment, but it may be said that the petrol capacity has been increased to some 1,100 galls., giving the machine a total loaded weight of 14,200 lbs. (6,460 kgs.).

The Rolls-Royce "Condor" is standard in every respect with the exception of the compression ratio, which has been somewhat raised in order to give a more economical fuel consumption. As is probably well known, this engine is provided with a reduction gear, and drives a large-diameter airscrew running relatively slowly, thus giving good propeller efficiency at low forward speeds, such as for taking off. In fact, it is doubtful whether the machine could be got off with a direct-drive propeller.

Cranwell aerodrome, near Grantham, Lincolnshire, has been chosen for the start, owing to its size. It is, however, somewhat unfortunate that this size is available in one direction only, east to west, since this limits the take-off to days on which either a westerly or an easterly wind is blowing. It had been intended that the "Horsley" should start on the morning of Monday last, May 16, but rain and a south-westerly wind precluded any possibility of taking off, although the weather along the route was reported to be fairly favourable. At the time of going to press with this week's issue of FLIGHT the same difficulty has been encountered. The machine has been ready every morning, but the wind at Cranwell has been in the wrong direction for taking off. In order to facilitate navigation over difficult country at night, the flight will only be undertaken while there is a full moon, so that should the unfavourable wind at Cranwell persist until Saturday or Sunday, the flight will be postponed until the next full moon.

The Flight Towards India: Flight-Lieut. Charles R. Carr, D.F.C., and Flight-Lieut. Leonard E. M. Gillman, by the Hawker "Horsley" with Rolls-Royce "Condor" engine, on which they are attempting a nonstop flight from England to India. Lieut. Carr is chief pilot, while Lieut. Gillman is second pilot and navigator.

["FLIGHT" *Photograph*

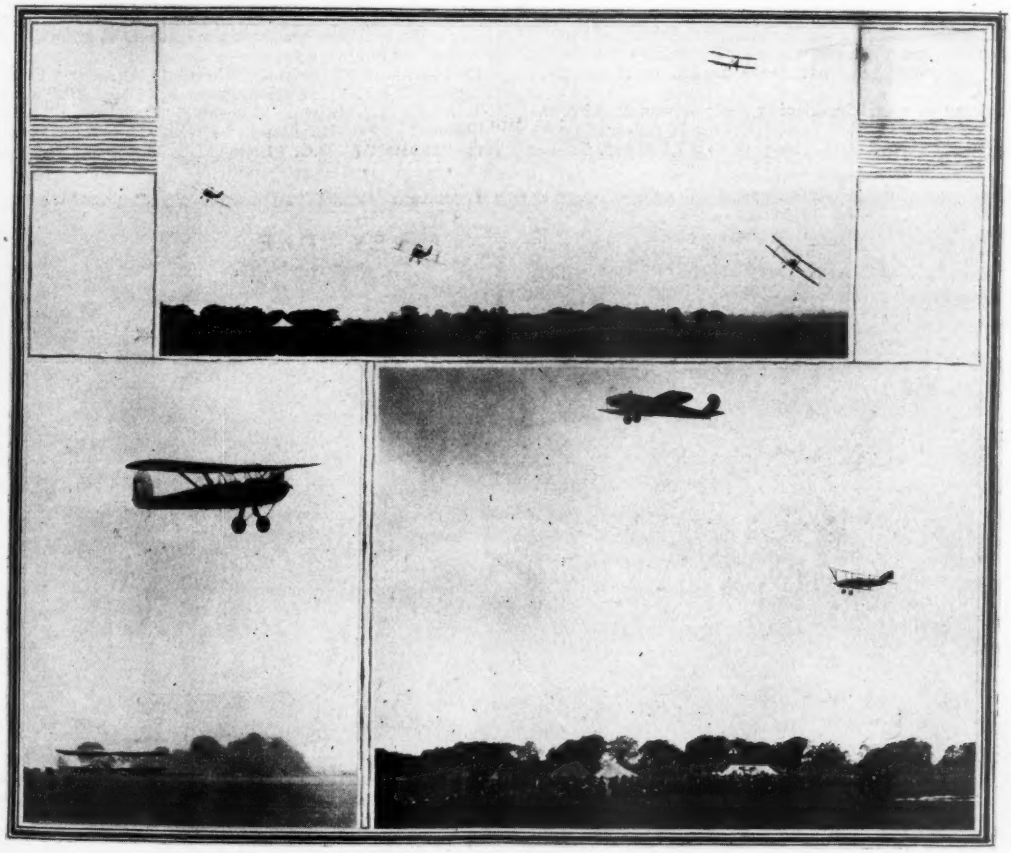
FLIGHT

HAMPSHIRE AIR PAGEANT

TAKING everything all round, H.A.P. No. 1 was a very happy affair, and must certainly be described as a record flying event. But—and we are afraid there must be a little "but"—this first Aerial Pageant, which was organised entirely by the Hampshire Aeroplane Club, was, as may have been seen from the advance programme of events published in last week's issue of FLIGHT, a very ambitious affair. Now, the organisation of any air race meeting is a specialised and by no means easy problem, and so it was not altogether surprising, considering the magnitude of the programme and the fact that this was the organisers' first effort, to find matters at times getting a little out of hand last Sunday up at Hamble.

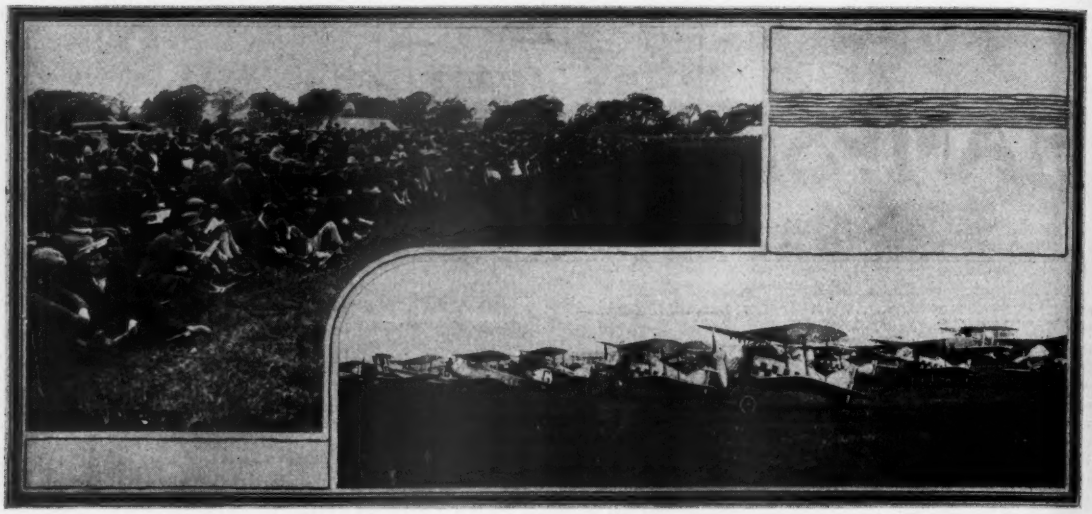
We do not in any way wish to find fault with the organisation as originally planned—for this was excellent in every way—it was, we think, simply a matter of H.A.P. No. 1 getting somewhat "out of control" and success running away with itself. The remedy, we courteously suggest, for H.A.P. No. 2 would be to call in the "specialists" previously referred to and provide a larger "ground staff" to carry out the hundred-and-one lightning duties called for in a big race meeting. None the less, the H.Ae.C. officials worked very hard on Sunday and did their best to cope with matters, while every credit—together with some sympathy—should fall to the official starter and time-keeper, A. G. Reynolds, for the manner in which he marshalled and despatched his large flocks in the races.

In spite of decidedly unsettled weather, spectators began to arrive at the aerodrome long before the first event was scheduled to commence, and these early arrivals—numbering several thousands by one o'clock—saw plenty of flying going on, for several competitors were making test flights, while the Imperial Airways' Handley Page "Hampstead" air liner, which had flown over from Croydon, started taking up its complements of 14 joy riders at an early hour, and kept hard at it until well into the evening. By 2.30 p.m., when the first event was timed to commence, the enclosures were well filled, but spectators were still arriving in fair



["FLIGHT" *Photographs*

THE HAMPSHIRE AIR PAGEANT: The race for the Wakefield Challenge Cup. Top, four D.H. "Moths" get away in a "bunch." Below, left, Major L. P. Openshaw well away on the Westland "Widgeon III," and, right, the first two home, who were, however, disqualified—Uwins on the Bristol "Brownie" and Le Poer Trench on "Halton I"



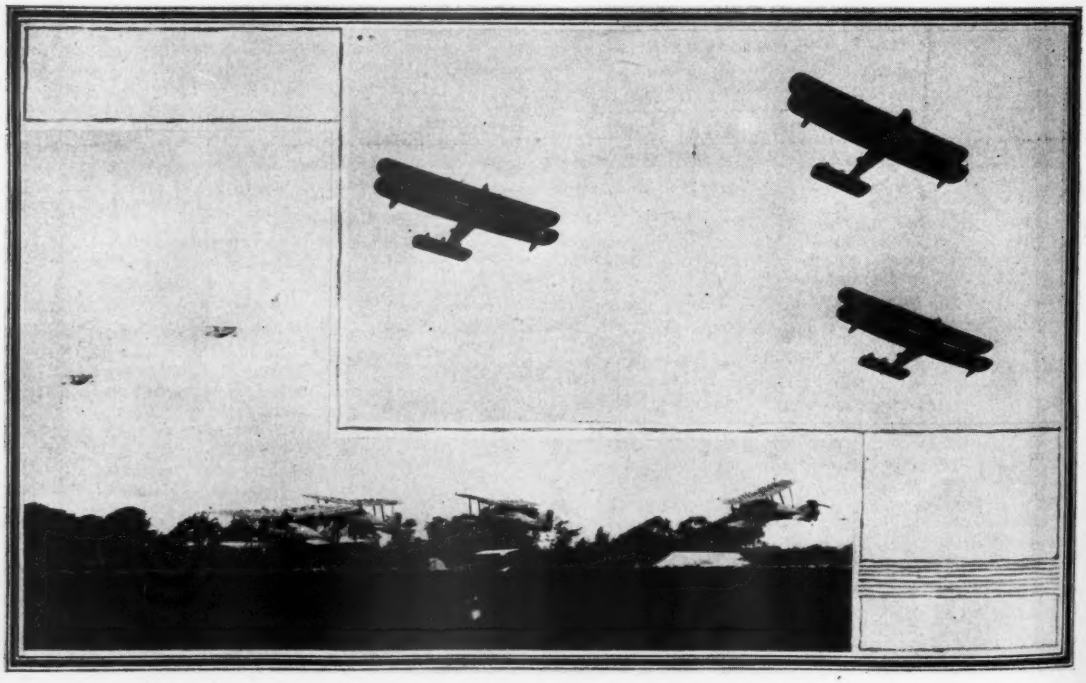
["FLIGHT" *Photographs*

THE HAMPSHIRE AIR PAGEANT : On the left is seen a small portion of the large crowd in attendance at the Hamble aerodrome last Sunday. The spectators extended thus nearly all round the large aerodrome! On the right are a few of the many machines that took part in the programme.

numbers up to 4 o'clock—in fact, we understand that the roads leading to the aerodrome were blocked with motors and pedestrians for hours. It was estimated that the number of spectators at the Pageant was in the neighbourhood of 40,000, while some 8,000 cars were parked in the various enclosures.

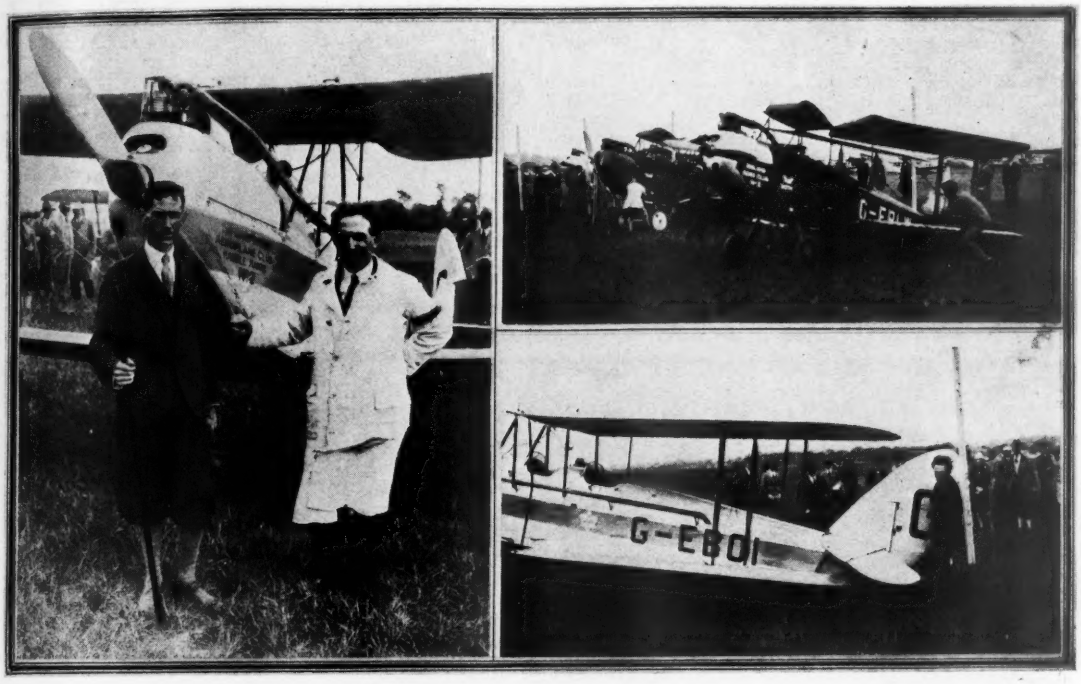
Some delay occurred in opening the programme with the Grand Fly-Past of Aircraft, in which some 20 different types, ranging from a 6 cwt. light 'plane up to a 1,300 h.p. ten-ton torpedo 'plane, taxied past the enclosures and then took off and flew round the 'drome. It was a really interesting event that was much appreciated by the spectators, and the machines included the following types :—

De Havilland 53 (Bristol "Cherub"), Hawker "Cygnet" (Bristol "Cherub"), Bristol "Brownie" (Bristol "Cherub"), "A.N.E.C. II" (Bristol "Cherub"), "Halton I" (Bristol "Cherub"), De Havilland "Moth" (A.D.C. "Cirrus"), Avro "Avian" (A.D.C. "Cirrus II"), Westland "Widgeon"



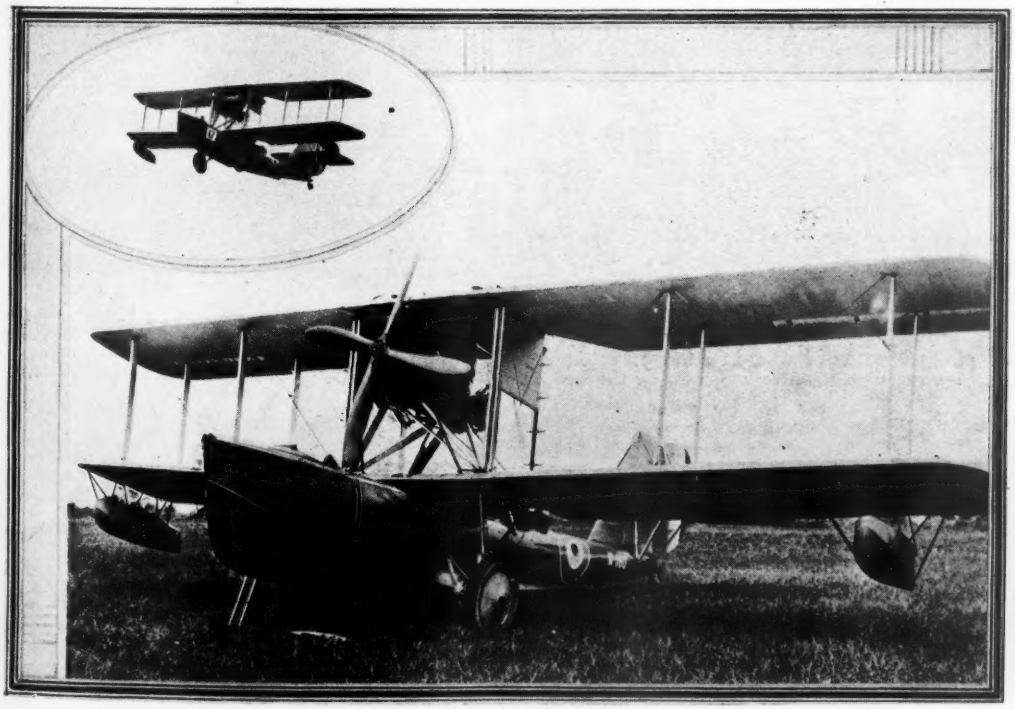
["FLIGHT" *Photographs*

THE HAMPSHIRE AIR PAGEANT: Event 3, Flying boat v. Land 'plane. Three Supermarine "Southamptons" flew over the aerodrome (top), at which a formation of 5 Gloster "Gamecocks" ascended (below) and chased them away.



["FLIGHT" *Photographs*

THE HAMPSHIRE AIR PAGEANT: Event 4, the Light Aeroplane Utility Race for the "Flight" Cup. The winners; (left), Flight-Lieut. G. I. Thomson and his passenger, Mr. McCracken, of the Hampshire Club. They wheeled their "Moth" out of its "hangar" (top), unfolded its wings, took off, flew one circuit, landed, re-folded, and pushed the machine back in the hangar (bottom) all in 7 mins. 14 secs.



["FLIGHT" *Photographs*

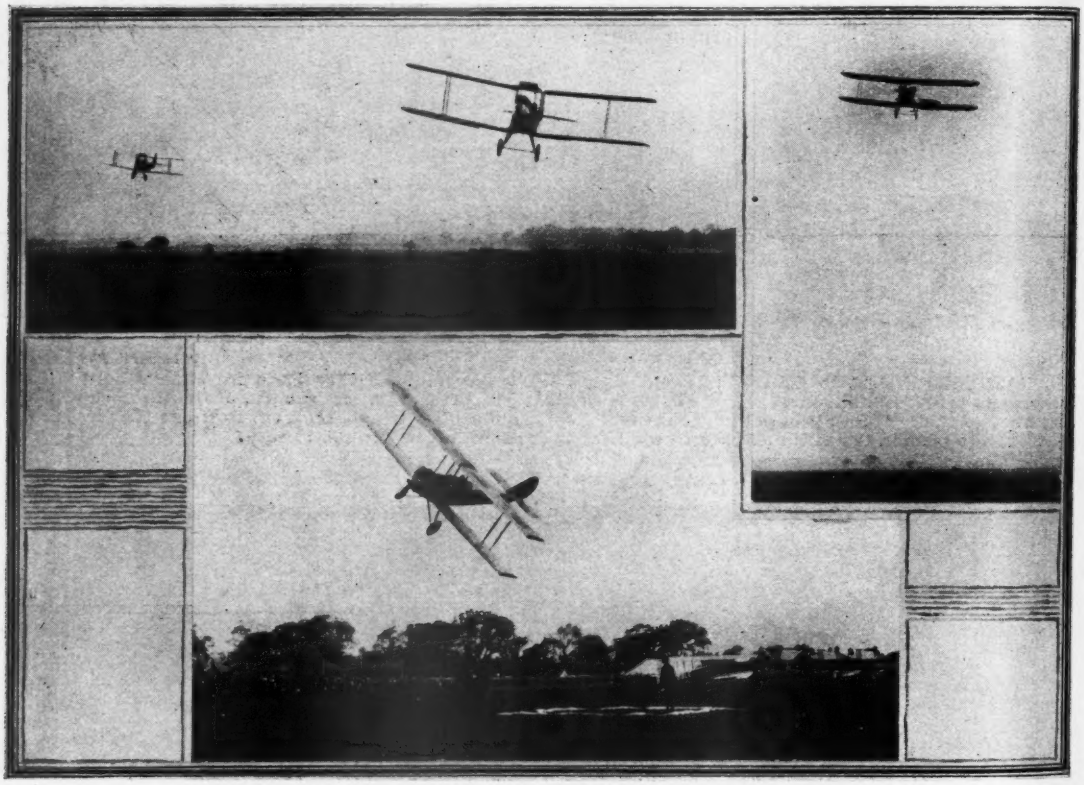
HAMPSHIRE AIR PAGEANT: The Amphibian Element. Two views of the Supermarine "Sheldrake" (Napier "Lion")

(A.D.C. "Cirrus II"), Blackburn "Bluebird" (Siddeley "Genet"), Boulton and Paul "P. 9" (90 R.A.F.), Avro "Lynx Tourer" (Siddeley "Lynx"), "S.E. 5A" (Wolseley "Viper"), Nieuport "Nighthawk" (Bristol "Jupiter"), "Nimbus"-Martinsyde (A.D.C. "Nimbus"), Gloster "Gamecock" (Bristol "Jupiter"), Supermarine "Sheldrake" "Amphibian" (Napier "Lion"), Hawker "Horsley" (Rolls-Royce "Condor"), Handley Page "Hampstead" (3-Bristol "Jupiter"), Avro "Ava" (2-Rolls-Royce "Condor"), Fairey "III. D" float seaplane (Napier "Lion").

The Fairey "III. D" took off, of course, from Southampton Water close at hand, and mingled with the others. Each machine was numbered, and as they taxied past the enclosures loud speakers broadcast their respective pedigrees.

The next event on the programme was the Wakefield Light Aero plane handicap, for a challenge cup presented by Sir Charles Wakefield, to be flown over two laps (22 miles) the "A.N.E.C. II" 'JO (N. H. Jones), and the R.A.E. Ae.C. Hawker "Cygnet" 'JH (R. L. Ragg). Two D.H. "Moths," 'LW (McDonough, Midland Ae.C.) and 'MF (Ogston, London Ae.C.), started off together next, with a late entry, another "Moth," 'PM, piloted by the Hon. Geoffrey Cuncliffe, close behind. After the Blackburn "Bluebird" 'KD (Longton) got away, a "bunch" of "Moths" departed, thus—'OU (Siddeley "Genet," D'Arcy Greig up); 'QV (J. D. Parkinson, Newcastle); 'PU (Lady Bailey); and 'OI (G. I. Thomson, Hampshire). A trio of Avro "Avians" followed—'QN (J. A. Gray, R.A.E. Ae.C.); 'QL (W. S. Douglas), and 'RC (Goodfellow)—while a fourth "Avian" (Bert Hinkler's 'OV), a Westland "Widgeon III," 'PW (L. P. Openshaw), and Capt. "D.H.'s" "Moth X," 'QH (H. S. Broad up), completed the starters.

At the end of the first lap the first four retained their respective positions, but 'MF had passed 'JH and 'LW,



["FLIGHT" *Photographs*

THE HAMPSHIRE AIR PAGEANT: Event 6, the President's Cup Race. Top (left), the Midland and Newcastle Club "Moths," with five others behind, completing the first lap; and (right), Longton on the Blackburn "Bluebird." Below, Bert Hinkler well away on his Avro "Avian" ("Cirrus"), with new landing chassis.

of the standard course. There was, however, a long delay in getting all the machines and pilots together and in their places on the starting line—in fact, this race did not start until about an hour after schedule.

During the wait, however, an impromptu race took place between a native of the 'drome—a hare—and a hound (a visitor). Both raced in excellent style in correct zig-zag form right across the 'drome, causing intense excitement. The result of this event—a narrow win for the hare—was announced by loud speaker and was received, we were glad to note, with loud applause.

Eventually the official air race started, in which some 19 out of the full 23 entries got away. All the entries for this and the other races were given in last week's FLIGHT, and as lack of space prevents our repeating them this week we would refer our readers to that issue. The first two machines away were a Bristol "Brownie" 'JK (Uwins) and the "Halton I" 'OO (le Poer Trench), and then close behind came the London Ae.C. "Brownie" 'JM (L. J. C. Mitchell), while 'KD and 'PM changed places. 'QV retired and 'OI spurted ahead of the others, and the rest also reversed their positions except 'QH, who was still last. The first two home, within a few seconds of each other, were 'OO and 'JM, but it was announced later that the former was disqualified for not carrying a "live" passenger, although he carried the equivalent in ballast and was "passed" by the judge at the start. The official first place therefore went to 'JM, while 'JK, who came in third, was also disqualified, so that 'QN, who was close behind, obtained second place.

The next four finished in the following order—'PM, 'OU, 'MF, and 'RC, and the remainder all arrived home more or less in "bunch formation." It was a good race, and the handicapper, F. Rowarth, is to be congratulated.

Meanwhile, three Supermarine "Southampton" flying boats (Napier "Lions") had arrived over the 'drome, and cruised about, forming a strange contrast to the sundry "Avians," "Moths" and other land 'buses. These three machines—under Sqdn.-Ldr. I. T. Lloyd (Calshot)—later

took part in a stirring display in which they dived in low over the aerodrome, and then, as they made off, a flight of five Gloster "Gamecocks" from No. 43 Squadron, under Sqdn.-Ldr. A. F. Brooke, took off and gave chase. These little machines soon overtook the three monsters, and after a hot engagement, drove them off.

Gloster "Gamecocks" also figured in another event during the afternoon, when three of them, from the same Squadron, piloted by Flight-Lieut. C. R. Smythe, Flight Officer C. W. Byas, and Sergt.-Pilot E. P. H. Wells, were put through one of the finest displays of stunting in formation we have yet seen. Loops, rolls, and many other aerobatics were executed —on many occasions enveloped in the low clouds—with what appeared to be only a few feet separating each machine. The precision and unity of the evolutions were remarkable.

The next race on the programme was the Light Aeroplane Utility Race, for the "Flight" Cup, and "Stormograph" (presented by Short and Mason, Ltd.) In this event, open to one "Moth" from each of the six subsidised clubs; each competitor, with the aid of his passenger, had to wheel his machine out of the "hangar" (two posts), unfold the wings, start up, fly one lap, land, and re-house the machine. This event produced four starters: J. McDonough (Midland) on 'LW; G. I. Thomson (Hampshire) on 'OI; G. M. Sparks (London) on 'MF; and J. D. Parkinson (Newcastle) on 'QV. 'LW and 'MF receiving 42 secs. start. 'LW got away very smartly, but unfortunately failed to round the mark correctly in taking off and was disqualified. The first to land was 'OI, and some smart handling saw the machine back in its hangar at the end of 7 mins. 14 sec. 'LW was next, but not placed; 'MF landed *in* the hangar and was also out of it, so second place went to 'QV with 10 mins. 22 secs.

After this came the "Pageant of Travel" relay race between Red, White and Blue teams each comprising Pedestrians (Cave-man, Dick Whittington, and Roman), Horsemen (Farmer, Highwaymen, and Cavalier), Cyclists (three Mid-Victorian Humbers), Motorists (Morris "Oxfords") and Air-pilots (on Avro "Avians"). This proved quite an amusing event, and was won by an "Avian" '(of, we believe, the Blue team).

The second big race of the day was a handicap for the President's Challenge Cup, presented by the Rt. Hon. Lord Louis Mountbatten, and Second and Third prizes of £20 and £15. This event produced 18 starters, as follows: "Halton I" 'OO (Poer Trench); Bristol "Brownie" 'JM (G. H. Craig, London); "ANEC 11" 'JO (N. H. Jones); Hawker "Cygnet" 'JH (R. L. Ragg, R.A.E.Ae.C.); "Moths" 'LW (McDonough, Midland); 'MF (Sparks, London) and Boulton and Paul P.9 'AWS (C. A. Rea); Blackburn "Bluebird" 'KD (Longton); "Moths" 'PM (Hon. Cuncliffe); 'QV (Parkinson, Newcastle); 'PU (Lady Bailey); 'OI (Thomson, Hampshire); Avro "Avians" 'QN (Gray, R.A.E.Ae.C.); 'QL (Douglas); 'RC (pilot unknown) and 'OV (Bert Hinkler); Westland "Widgeon III" 'PW (Openshaw); and "Moth X" 'QH (Broad).

This time competitors flew three laps (33 miles), and 'OO, 'JM and 'JO maintained their positions during first and second laps, 'WS obtaining the lead on the last lap. 'JH retired after starting, while most of the others changed positions slightly, 'OI, 'RC and 'QN pushing well forward each lap. The finish of this race was remarkably close, the first eight being home within one minute! Although 'WS was first in, he was disqualified, and first, second and third went to 'OO, 'OI and 'JM respectively. The next four in were 'RC, 'QN, 'QV and 'MF.

Displays of Eccentric and Crazy flying were given by Flight-Lieut. H. C. Calvey, on a Gloster "Gamecock" and by Longton (his original part') on an Avro "Gosport."

Then, when it was somewhere near 7 oclock, the last event on the programme was flown—the Morris Open Handicap, over two triangular courses of 19 and 11 miles respectively, for the Morris Challenge Cup, presented by Mr. W. R. Morris, and £100. Second prize, £30; Third Prize, £15.

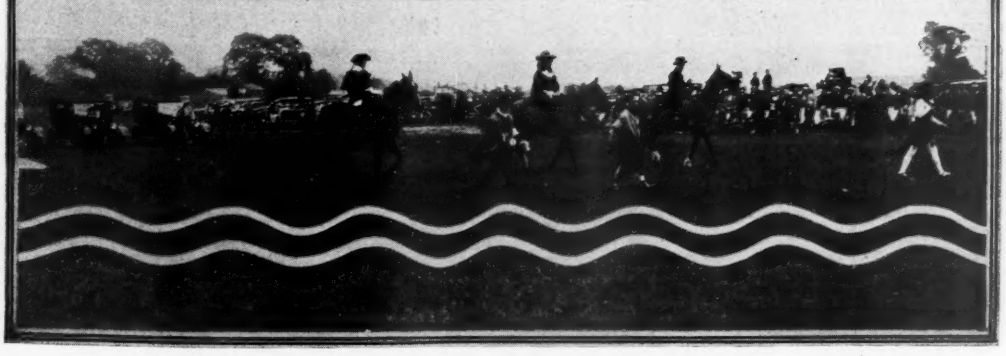
This produced 22 starters out of an entry of 30, as follows:— "Halton I," 'OO (Poer Trench); Bristol "Brownie" 'JM (H. Spooner, London); "ANEC 11" 'JO (Jones); Hawker "Cygnet" (Ragg, R.A.E. Ae.C.); "Moths" 'LW (Mc Donough, Midland), 'MF (K. M. Beaumont, London); Boulton & Paul P. 9 'AWS (Rea); Blackburn "Bluebird" 'KD (Longton); "Moths" 'PM (Hon. Cuncliffe), 'OU (D'Arcy Greig), 'PG (A.G. Lamplough), 'OI (Thomson, Hampshire); Avro "Avian" 'RC (Goodfellow); Westland "Widgeon III" 'PW (Openshaw); Avro "Lynx" 'KQ (H. A. Hamersley); "Moth X" 'QH (Broad); S.E.5*a* 'QK (Youell); D.H. 37 'DO (A. S. Butler); S.E. 5*a* 'QM (A. H. Wheeler); S.E.5*a* 'OG (D. A. N. Watt); and "Nimbus" Martinsyde 'OJ (H. H. Perry).

Unfortunately, while this race was in progress, there seemed to arise a sudden activity amongst all other machines on the 'drome, which, added to the fact that one's brain (such as it was) by this time was practising new forms of side-rolls, etc., made it very difficult to follow. We found it impossible to keep count of the various competitors—especially as laps 1 and 2 were entirely different. However, the higher-powered machines rapidly overhauled the smaller fry, and roared home all in a bunch. The first in was B. H. Youell, on Keneth Hunter's S.E.5*a*—which, by the way, had only received its airworthy certificate on the day before the race, about which more anon—followed a fuselage's length behind by Butler on 'DO, with Watt on SE5*a* 'OG almost broadside on. Then in quick succession came Perry ("Nimbus"-Martinsyde 'OJ), Hamersley (Avro-"Lynx" 'KQ), Thomson ("Moth" 'OI), A. Goodfellow ("Avian" 'RC), and Spooner ("Brownie" 'JM).

Altogether, it was a thrilling conclusion to a splendid day's flying.

Results:

	Handicap. m.	Handicap. s.	Flying Time. m.	Flying Time. s.
Wakefield Cup				
Disq. Trench, "Halton I" 'OO ..	0	17	21	31
(1) Mitchell, "Brownie" 'JM ..	1	19	21	36
Disq. Uwins, Bristol "Brownie" 'JK	0	0	21	40
(2) Gray, Avro "Avian" 'QN ..	7	6	22	11
(3) Hon. Cuncliffe, "Moth" 'PM	5	28	22	12
(4) Greig, "Moth" 'OU	5	58	22	12½
(5) Ogston, "Moth" 'MF ..	4	46	22	12⅘
(6) Goodfellow, Avro "Avian" 'RC	7	6	22	14
President's Cup				
Disq. Ragg, Boulton-Paul P9 'AWS	6	44	31	31
(1) Trench, "Halton I" 'OO ..	0	25	31	38
(2) Thomson, "Moth" 'OI ..	8	21	31	39
(3) Mitchell, "Brownie" 'JM ..	1	58	31	39⅘



["FLIGHT" *Photographs*

HAMPSHIRE AIR PAGEANT: "The Pageant of Transport"—a relay race between pedestrians, horsemen, cyclists, motor cars, and light planes

	Handicap.		Flying Time.	
	m.	s.	m.	s.
(4) Goodfellow, Avro "Avian" 'RC	9	54	31	56
(5) Gray, Avro "Avian" 'QN ..	9	54	32	13
(6) Parkinson, "Moth" 'Q.V. ..	8	21	32	16
(7) Ogston "Moth" 'MF ..	6	44	32	30
Morris Open Handicap				
(1) Youell, SE5*a* 'QK	11	37	26	8⅘
(2) Butler, D.H. 37 'DO	11	38	26	10
(3) Watt, SE5*a* 'OG	11	56	26	18
(4) Perry "Nimbus"-Martinsyde 'OJ	13	3	26	18⅘
(5) Hamersley, Avro-"Lynx," 'KQ	9	34	26	35
(6) Thomson, "Moth" 'OI ..	7	18	27	2
(7) Goodfellow, Avro "Avian" 'RC	8	31	27	3
(8) Spooner, Bristol "Brownie" 'JM	2	35	27	10

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

COMMITTEE MEETING

A MEETING of the Committee was held on Wednesday, May 11, 1927, when there were present:—Brig.-Gen. Lord Thomson, P.C., C.M.G., D.S.O. (in the chair); Mr. Griffith Brewer; Sir Alan J. Cobham, K.C.B., A.F.C.; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; Lieut.-Col. Sir Francis K. McClean, A.F.C.; Lieut.-Col. M. O'Gorman, C.B.; Mr. F. Handley Page, C.B.E.; Maj. H. A. Petre, D.S.O.; Mr. T. O. M. Sopwith, C.B.E.; Capt. C. B. Wilson, M.C.; and the Secretary.

Election of Chairman and Vice-Chairman.—Lord Thomson and Lieut.-Col. Sir Francis McClean were unanimously elected chairman and vice-chairman respectively for the year 1927.

Scheme of Association of Aero Clubs.—The report of the Conference of Aero Clubs held on April 27, 1927, was submitted by Lieut.-Col. M. O'Gorman, and the scheme of association of aero clubs was unanimously approved.

Award of the Britannia Trophy for 1926.—The Britannia Trophy for the year 1926 was unanimously awarded to Sir Alan J. Cobham for his flight from England to Australia and back, June 30–October 1, 1926, on a D.H.50 fitted with a 385 h.p. Armstrong-Siddeley "Jaguar" engine.

Aviators' Certificates.—The following aviators' certificates were granted:—

8087. Cyril Robert Campkin, London Aeroplane Club.
8088. Mrs. Mary Teston Luis Bell, De Havilland Flying School.
8089. Frank William Gattrell, Lancashire Aero Club.
8090. Alexander Frew Wallace, R.A.F. Graduation Certificate.
8091. Miss Winifred Sawley Brown, Lancashire Aero Club.
8092. Herbert John Louis Hinkler.
8093. Nabih Abdalla, Lancashire Aero Club.
8094. Thomas William George Eady, London Aeroplane Club.
8095. Hylton Ralph Murray-Philipson, Henderson Flying School, Ltd.
8096. John Hugh Saffery, London Aeroplane Club.
8097. James Stawart, Newcastle Aero Club.
8098. William Alexander Fallon, Lancashire Aero Club.
8099. Wilfred Charles Dickinson, Lancashire Aero Club.

Election of Members.—The following new members were elected:—

Capt. James Leonard Neville Bennett-Baggs.
Lieut.-Comdr. William Henry Bernard de Mussenden Leathes.
Flight-Lieut. Percy Ivor Vincent Rippon.
Flying Officer Herbert Hollick-Kenyon.
Harry Gordon.
John Russell Willis Alexander.
Frank Cook.
William Loudon Douglas.
Maj. Frank Pilkington Scott.
Sqdn.-Ldr. Tom Harry England.
Capt. Robert Arthur Loader.
Capt. Sydney Lane Foster St. Barbe.
Flying Officer Edmund Charles Roark.
Francisco Samuel Short.
Capt. Kenneth Noble Pearson.

F.A.I. Conference, Zurich, 1927.—Lieut.-Col. M. O'Gorman was appointed delegate to represent the club at the Conference.

Sub-Committees.—The reports of the following committees were received and adopted: Racing Committee, Joint Standing Committee (R.Ae.C. and S.B.A.C.).

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary.

THE AIRSHIP CLUB

(*Affiliated to the Royal Aero Club.*)

THE Annual General Meeting of the Members of the Airship Club will be held at 3, Clifford Street, London, W.1, on Tuesday, May 31, 1927, at 6 p.m.

The Committee of the Club elected at the General Meeting held on December 15, 1926, to carry on till April 20, 1927, were as follows: R. M. Balston, Capt. F. L. M. Boothby, the Hon. Claude Brabazon, Griffith Brewer, Lord Cunliffe, the Hon. A. F. de Moleyns, Lieut.-Col. W. Lockwood Marsh, Major C. C. Turner, Wing-Com. A. C. Winter. Squad.-Leader R. S. Booth has since been added.

The whole Committee retire and are eligible for re-election.

Nominations for the Committee signed by two members of the club should be received by the secretary not later than noon on May 31, 1927.

Gordon Bennett Balloon Race

THE Airship Club has decided to make one entry for the Gordon Bennett Balloon Race to be held in Denver, U.S.A., on September 10 next.

Members wishing to take part in the race are requested to forward their names to the secretary not later than the 30th inst.

A fund has been started with the object of assisting in the expenses incurred in sending out the team and balloon to Denver to represent the club, and the following donations have so far been promised: Mr. Griffith Brewer, £10 10s.; Lieut.-Col. Sir Francis K. McClean, £6 6s.; Squad.-Leader R. S. Booth, £5; the Hon. A. F. de Moleyns, £4. The organisers of the race in Denver will contribute £60.

Members wishing to assist are requested to forward their donations to the secretary.

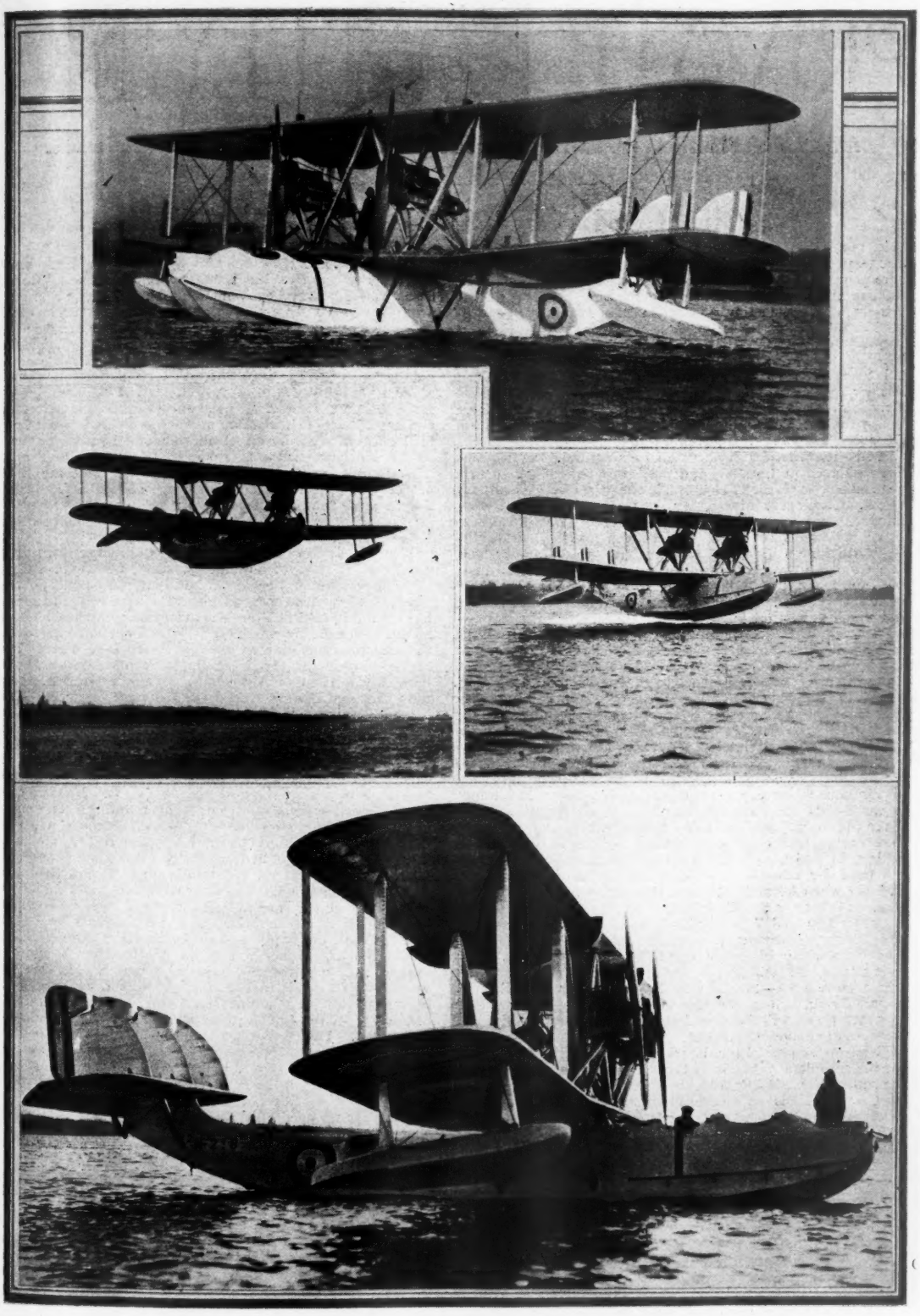
HAROLD E. PERRIN, *Secretary.*

WHITSUNTIDE AIR RACES AT BOURNEMOUTH

THE following is the programme for the two days' Air Races, June 4 to 6, 1927:—

Private Owners' Handicap .. .. Stakes £80
High Power Handicap .. .. .. Stakes £70
Medium Power Handicap .. .. Stakes £100
Ladies' Purse £35
Lower Power Handicap .. .. .. Stakes £35
Bournemouth Hotels Association Sweepstake.
Bournemouth and District Business Houses Sweepstake.
Consolation Handicap .. .. .. Stakes £50

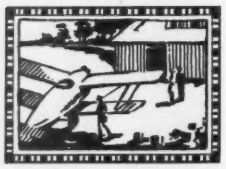
Entries close Thursday, May 26, 1927. Full particulars and entry form can be obtained from the Royal Aero Club, 3, Clifford Street, London, W.1.



METAL CONSTRUCTION : These photographs show the first of the Supermarine " Southamptons " to be fitted with an all-metal hull. This is of slightly different shape, and is claimed to weigh some 500 lbs. lighter than the corresponding wooden hull. By the time the water soakage is taken into consideration, the difference in weight becomes even more pronounced, and the saving is reflected in either greater useful load or an increased range. The two engines are Napier " Lions "

FLIGHT

MAY 19, 1927

PRIVATE  FLYING

A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member

THE COST OF RUNNING A "MOTH"

IT is, perhaps, more essential that a light aeroplane should be cheap to run than cheap to buy. There are probably more people who can afford to buy a machine than there are who can afford to run one. On the question of running costs of their popular machine the De Havilland Co. have gone to considerable pains to estimate a yearly expenditure of a "Moth" owner. As they aver, it is very easy to give verifiable figures relating to petrol and oil consumption and maintenance, but it is by no means easy to give the total cost per annum without some idea of how often and for what purpose an owner intends to use his machine; so they have chosen the best course in these circumstances by working on a hypothetical gentleman, appropriately named Mr. Mothews, with his hypothetical performance per annum. They grant him residence in London, and first they endeavour to find what mileage he is likely to travel in that time by the ordinary means. They give him a car, remarking, in parentheses, quite reasonably, that it is doubtful whether he will continue to use it when his "Moth" has proved itself. This car he uses both for business and pleasure, and he will cover, say, 12,000 miles in a year with, perhaps, 3,000 miles in trains, and of this total of 15,000 miles 3,000 miles are within the environs of towns. In this respect the "Moth" will not help him much yet—that is, within the confines of the town—so, leaving out 3,000 miles, they average the remaining 12,000 miles at 25 m.p.h., which is well above the legal limit and is not a bad average in these days, when the potential speed of cars is rendered abortive through traffic congestion. At this accepted speed our Mr. Mothews spends 480 hours per year in travelling, whether by car, train or ship, whereas in the "Moth" he will travel at 85 m.p.h., and thus reduce this time to approximately 141 hours—a saving of 339 hours over the same distance. Now, assuming that our hero works for his living, poor fellow, with a remarkable insight into his circumstances we can assume that his leisure is confined to week-ends and evenings, of which he naturally wants to make the most. We can rule out that his idea of recreation is returning to the office, and take it that he likes golf or fishing, in which case his machine will materially increase the time for devotion to them, besides making him very amiable when he arrives. Granting an hour's journey each way, an hour for the diversion, whatever it is, with a start between 6.30 and 7 p.m., this brings places like Brighton, Cambridge, Eastbourne, Southampton, and Stratford-on-Avon well within his range, and to get an idea of his evening flying time, we will suppose he takes advantage of such a trip once a week—that is, say, fifty in a year, equalling 100 hours' flying. Now, for the week-ends, despite our fickle climate, there will be the desire to fly away beyond the confines of an evening's flight.

Between two and three hours each way is a short journey for the aeroplane yet he is by the sea at Barmouth, Falmouth, Newquay, West Hartlepool, among the lakes in Cumberland, in Ostend, Paris or Brussels, whilst another half-an-hour takes him to Scotland, to practically any part of Belgium, and well in France. We will, for our purpose, fairly grant, twenty such trips at five hours each, equalling 100 hours flying for week-ends for a year.

Next we have to come to his holidays. He will probably use his "Moth" to the very utmost and twenty hours will carry him a long way. Then, perhaps, his business confines his holiday to within easy distance of London and he will occasionally have business in say, Manchester, Glasgow, Belfast, or on the Continent, and allowing for a few such trips this will mean, say, another twenty hours. Human nature being what it is he will want his friends to see what he can do in the air and so he will take them up and use perhaps ten hours in this way. That is a modest surmise of Mr. Mothews' flying time in the course of a year, and if you are very good at addition sums you will find that it totals 250 hours or 21,250 miles. That represents his performance. What does it cost?

Fuel

First take petrol; the ordinary No. 1 obtainable anywhere. Incidentally garages on the borders of suitable landing fields would be very convenient to Mr. Mothews and quite profitable to the owners, if thirty or forty like him landed in the course of a day. On four gallons of this admirable petrol the "Moth" will not run dry for an hour, but allowing for waste, etc., we will say the use per hour from the financial point of view is 4½ gallons which at 1*s*. 2½*d*. per gallon equals a yearly expenditure of, say, £68. If the "Cirrus" engine is modest on the petrol the need of oil is almost imperceptible and even allowing for waste again when clearing the sump, etc., it is quite happy on an allowance of 1½ pints per hour, so Mr. Mothews will need no more than 47 gallons on his 21,250 miles and this at 5*s*. per gallon will mean an oil cost of £11 15*s*. Thus fuel cost for that mileage is £79 15*s*., or a little more than a half-penny per mile.

Maintenance

To arrive at any conclusions about maintenance or running repairs as it is more familiarly termed, we ought really to know the characteristics of our hero, Mr. Mothews. So much depends, as regards cost, on his attitude towards his mount, but assuming that he gives the attention to his machine that he did to the car he was fond of we can get some guide from the experience of one of the light aeroplane clubs. They expended only £21 11*s*. 2*d*. on replacements in a year with a total flying time of 470 hours. When it is remembered that this machine was used on the hard, exacting school work it is fair to say that our hero need not expect to spend more than £5 in this direction. There are always competent ground engineers at any aerodrome and for the modest charge of 7*s*. 6*d*. they will throughly inspect a machine and ensure its airworthiness and if this valuable help is received ten times in a year the cost will be £3 15*s*. Now we come to the more serious question of overhauling. The engine has to have a top overhaul after every 150 hours' flying and it is a job which anybody with any interest in mechanics can undertake. It is little more than decoking a car engine, grinding in the valves, etc., and here it should be noticed that an aero engine has an easier time than a car engine. It runs nearly all the time at half throttle, it receives no violent acceleration or deceleration, no loads suddenly applied, no grit or dust from roads, and no overheating through hills or traffic blocks. None-the-less its construction is quite as robust and requires no finer adjustment. If, therefore, we allow £5 for this top overhaul we should be assured of a first-class job and cannot reasonably regard the price as excessive. After 450 hours' running a complete overhaul is demanded. The engine has to be taken down, the bearings examined, piston rings removed and scraped, etc. Naturally, this is a more expensive job and necessitates a ground engineer's certificate on the completion, but £20 should cover it. As, however, we have limited our hero to 250 hours' flying in the year we need only claim a proportionate part of that cost, say £11.

There now remains only the yearly overhaul of the machine for the renewal of its Air Ministry Certificate of Airworthiness. This, again, is within the province of the ground engineer only. The planes have to be opened in order that the interior may be inspected, merely as a precaution and not because any trouble is likely to be found there, all fittings carefully inspected to ensure that they have not crept, or that bolts, etc., have not drawn. Similarly, the fuselage joints are scrutinised and the undercarriage dissembled, cleaned and refitted. All controls which show the slightest wear are replaced and generally any slackness which may have developed under the strain of landings is taken up and rectified. On the completion of all this, our Mr. Mothews can be assured of complete structural safety for another year. The cost of this essential work will be in the region of £20 which includes the five guineas charged by the Ministry for issuing the Air-

worthy Certificate. By the aid of further accurate addition all these items under the heading of maintenance amount to £44 15*s.*, well under a half-penny per mile, which is reasonable and probably lower than that for a car totalling the same mileage. Of course, it will be noted that certain items like the cost of the certificate are included in this estimate under the heading of running costs which are not affected by the variation in miles flown, but they will be better appreciated as shown and we can now come to those costs which are purely fixed annual figures.

Housing and Landing

First there is the cost per year for garaging. At the aerodromes like Stag Lane, there are "lock-ups" specially built for the housing of the "Moth." They have folding doors in the front, and a wicket door in the rear, and are equipped with a bench and vice. The rent is £1 per week, in which is included the external attendance to the machine like cleaning, any assistance required in getting the machine out and returning it after flight, and the full use of the aerodrome. Again, in comparison with a car, this cost of £52 a year is favourable, for two or three cars could be housed in a "lock-up" and the charge for garaging a car in London is about £1 per week and 10*s.* in the country. We have previously supposed that Mr. Mothews would spend 20 nights away from home in a year and there is no reason why he should not picket his machine down in a field then, but if he finds himself occasionally at an aerodrome, and chooses to pay the 2*s.* 6*d.* per night charge for garaging, his total yearly expenditure will then not be heavy. Say, 10 nights at 2*s.* 6*d.*, and that will make £1 5*s.*

He may find at times that it is necessary to pay landing fees, such as at licensed aerodromes, and this item will be 2*s.* 6*d.* per landing. For this fee, certain facilities apart from landing are given, like weather reports by wireless over the route it is intended to travel; also Customs clearances, when going to or coming from abroad. Add 10 such landings yearly it will only amount to £2 10*s.*, and the figure may come down. Housing costs then come to £54 10*s.*, again less than one-halfpenny per mile.

Other Expenses

To continue our investigation into these sordid financial demands to the bitter end, we come to Mr. Mothews' licence next, which costs 5*s.* per year, plus £1 1*s.* for medical examination and tests when required. The details of this item, and the cost of learning to fly, are familiar to FLIGHT readers, for they were expounded in the first appearances of our "Private Flying" feature. In their estimate of Mr. Mothews' expense, the De Havilland Company have included the cost of being a member of the Royal Aero Club, which will keep a private flier well in touch with all that matters in aviation. The subscription is £6 6*s.* a year. Where foreign travel is done, there must be added the Customs deposit required in foreign countries, which is approximately equal to 33⅓ per cent. of the value of the machine, to be paid at the air port at which entry has to be made. Through the good offices of the Royal Aero Club, however, he can dispense with the worry of this formality everywhere he goes by paying £1 11*s.*6*d.* for a Carnet, which is practically a fidelity guarantee, and is available for one month and for as many trips required. It is accepted in most European countries. If two of these are required per year, the cost will only be £3 3*s.* Allow for flying kit and maps, etc., and we can regard this total as £9 14*s.*

Insurance

It is over this item that Mr. Mothews must brace himself up to receive the worst. As far as we are concerned, he has already gone through the ordeal and borne it bravely, for in a recent issue of FLIGHT we laid bare everything. We know that it laid some low. At least one potential private-owner-pilot followed our systematic analysis of the cost of being a private-owner-pilot with increasing hopes, until he got to insurance; then he went down never to rise again. In this analysis of Mr. Mothews' expense, this item has been put at £100 per year.

That is about a fair estimate. As they remark, it is difficult to arrive at, as so many considerations affect the cost. It is now possible to tabulate our different items.

	£	s.	d.
Petrol and oil	79	15	0
Maintenance	44	15	0
Housing, etc.	54	10	0
General expenses	9	14	0
Insurance	100	0	0
£288	14	0	= Total cost for 21,250 miles in the "Moth,"

or 3·26 pence per mile.

THE DUCHESS OF BEDFORD'S TOUR

IT is the peculiarity of all casual flights to be late. It is because of the nursing an aeroplane requires, or rather its engine, and its susceptibility to weather. These causes it will always be partial to though in a lesser degree as the evolution of the aeroplane proceeds. When it is one's task to wait the arrival or departure of a machine there is considerable compensation if it is designed for Stag Lane aerodrome. It is a most interesting aerodrome. Not only is it the home for the De Havilland Flying School and the London Aeroplane Club, it is also a terminus where the arrivals and departures of private fliers as well as others, of course, can always be expected, for it is a most convenient civil aerodrome for London. Last Thursday, May 12, the Duchess of Bedford was due to arrive there in the "Moth" flown by Capt. C. D. Barnard, one of the instructors of the Reserve School. During the afternoon Capt. Stack suddenly appeared on the aerodrome jubilantly making preparation to fly up to Cranwell in a "Moth" with Mr. Schwaiger as passenger to lecture before the Cadet School there in the evening, timing his arrival for about 5.30 p.m. He told us of the fine reception he had received from his old club at Woodford on Sunday week when he flew up there on the Avro "Avian" with Mrs. Stack, having previously gone to Hamble to get it. He had arrived back at Stag Lane again a few days later and then proceeded to Hamble. Capt. Stack is a very entertaining lecturer, having a gift of humour. Lady Bailey also landed during the afternoon in her silver-grey "Moth," which is her regular means of travel. Lord Ossulston was there with his blue "Moth" which he keeps in very good condition and smart appearance. He too keeps his machine for flying and only thinks of travel in terms of the air. When the eclipse takes place shortly he is expecting to take up an observer for the purpose of making observations. Earlier in the afternoon news had come through of the departure of the Duchess of Bedford from Lympne. A strong head wind hindered the last lap but at last the "Moth" was reported to have reached Croydon and departed, again, only landing for the benefit of a press photographer. Just before 5 p.m. it came over Stag Lane steadily at a low altitude and when over the centre of the aerodrome Capt. Barnard turned it into a short gentle spin, then disappeared behind the hangars and works and suddenly shot through to make a perfect landing.

The arrival at Stag Lane of the Duchess of Bedford and Captain Barnard in the D.H. "Moth" on May 12.

When the green "Moth" taxied in the Duchess of Bedford did not seemed to be relieved that her long flight over Europe to Morocco and back was ended. She declared her enjoyment of their spectacular ascent when Capt. Barnard asked her. Although in her sixty-second year, the 55 hours spent in the air during the three weeks' tour had not fatigued her in the least. Questioned on the published reports that the object of the flight was for the purpose of bird study, Her Ladyship was very anxious that it should be denied. It was not even an incidental intention of the tour, and she did not know how the rumour possibly originated. It was practically impossible to make such a study under their conditions. They flew too high, for one reason, and then in a small machine like the "Moth" there was no petrol to spare to delay for any time on the way, as their course led to long stages over

THE DUCHESS OF BEDFORD'S TOUR: This sketch map traces the route followed by the "Moth" on the tour to Morocco through France and Spain, and the return on a roughly parallel course. The mileage flown was 4,500, equalling 54 hrs. 45 mins.

country where landings were not possible. On two occasions, incidentally, some eagles and vultures had been sighted far below and Capt. Barnard had dived down and followed the eagles a short distance. It was for the scenery alone that the long tour was undertaken, and this was found to be very splendid indeed. The experience was thoroughly enjoyed and the machine excited her admiration because it was so small and yet so comfortable. The tour began on April 21 from Woburn Abbey, in Bedfordshire, to which Capt. Barnard flew in 40 mins. Croydon was the first stage, accomplished in 30 mins., then Lympne 50 mins., and Paris in 2 hrs., which ended the day's flying. During this stage the weather was beautiful. It was intended to reach Biarritz the following day but a heavy mist compelled them to return to Bordeaux, and during this stage from Paris they reached Tours in 2 hrs. 15 mins., and Bordeaux in 2 hrs. 50 mins. Leaving here, they made their return again after 55 mins. flight. On April 23, Biarritz was reached in 1 hr. 30 mins. Mr. Leslie Hamilton was here with his Vickers' Viking. From here they left the next day and passed eastward over the Pyrenees above magnificent scenery, reaching San Sebastian in 1 hr. 15 mins. on the 24th, and arriving at Burgos in 2 hrs. 30 mins. on the 25th. Before starting the next stage to Madrid on the 26th, Capt. Barnard was rather dubious about crossing the two high ranges, the Pyrenees and the Guadaramas as the "Moth" was loaded with three suitcases, four spare tins of petrol, oil, spares, etc., whilst the weather was very hot. However, they managed to reach 9,000 ft. with ease. The visibility was exceptional and mountains could be seen 50 miles distant. It was just before reaching Burgos that the eagles were seen but far from showing hostility (they do appear to dislike some pilots) they had much difficulty in keeping near to them. A large flock was sighted perched on a peak. They kept "putting them up" for some time, said Capt. Barnard, but they ultimately flew out of reach.

From Madrid to Seville, on April 27, it was necessary to land twice for petrol, first at Daimiel and then at Cordova, and the flight took 5 hrs., done in three stages. The first to Daimiel took 1 hr. 40 mins., Cordova 2 hrs., and Seville 1 hr. 20 mins. There is an emergency landing ground at the former place, and also a plague of black flies, but at Cordova, which is a beautiful little town, a landing was effected in a field. At Seville the "Moth" landed just before Mr. Hatchett returned from Morocco. He has been flying on the Seville-Larache route for some years. He very kindly made and fitted for them a spare petrol tank holding 6½ gallons, for the homeward route was to include several long flights beyond the normal range of the machine. During an aerial fete Capt. Barnard demonstrated the "Moth" before King Alfonso and the Prince of Wales. They were invited to spend a day or two at Jerez with the British Consul there, Mr. Guy Williams. The flight there was completed in 1 hr., and it covered a very flat area where herds of young bulls were seen, and also many vultures. The polo ground at Jerez was chosen to land on. The "feria" was in full swing, and there were two big bull fights. Mr. Williams made the visit a most enjoyable one for the two days. From this place a detour was made to Tangiers to see Arcos de la Frontera, a beautiful town situated very high on the hill side. It took 1 hr. 15 mins. to reach Tangiers, and during the crossing of the Straits of Gibraltar fine weather prevailed, and the snow-capped Atlas mountains could be seen distinctly in the distance. The Cecil Hotel is recommended by the travellers. The manager, Mr. O'Brien, kindly motored 15 miles to the aerodrome to take them to the hotel. The next stage, on May 2, from Tangiers to Malaga, took 1 hr. 35 mins., and the mountainous journey to Granada on the next day another 1 hr. 15 mins. This town is famed for the old Moorish stronghold—the Alhambra—and Spain should not be visited without including this wonderful place in the Sierra Nevada mountains in one's itinerary, the sight from the air being truly magnificent. On the same day, May 3, the flight was continued to Seville to get the new small tank, occupying 2 hrs. 25 mins. A return to Granada was made on the 5th, occupying 1 hr. 45 mins. Here a delay was caused for the day due to clouds falling below the mountain summits, but on the 6th, Alicante was reached in 3 hrs; Valencia in 1 hr. 15 mins.; and Barcelona in 3 hrs. 5 mins.

The long stretch to Alicante was most interesting. The Latécoère Air Line has a small landing ground there. The trip on to Barcelona was rather hazardous as there was no landing ground or even a good field, and as it was impossible to make the journey non-stop it was decided to essay a landing in the region of Valencia, which was accomplished at the North beach, which Capt. Barnard thinks would be an awkward spot to land in except with a "Moth" and the help of a strong wind blowing in the right direction. Owing to a gale blowing from the north, Barcelona was not actually reached until dark, and then the landing was made at the Spanish Naval Aerodrome where the authorities were very kind and attentive to the travellers, and a most interesting two days were spent, which included an expedition to Montserrat. The road from the aerodrome at Llobregat to Barcelona was quite the worst encountered, pot-holes being feet deep for 10 miles. The rest of the long tour through Spain and France was without much incident. Landings were made at Montpelier, Lyons, Dijon, Paris, Lympne, Croydon, Stag Lane and Woburn. Montpelier was reached after 3 hrs. 5 mins. flight from Barcelona, Lyons took another 3 hrs. 5 mins., both on May 9. On May 10 it took 2 hrs. to reach Dijon, and another 3 hrs. to Paris; Lympne, 2 hrs. 30 mins.; Croydon, 50 mins.; Stag Lane, 15 mins.; and Woburn, 50 mins., completed the interesting tour on May 12. The total number of hours flown was 54 hrs. 45 mins., and during the three weeks' tour no engine trouble was experienced at all. 4,500 miles were covered. The plugs and filter were removed at Barcelona for inspection, and that was the only occasion. The longest flight in one day was between Granada and Barcelona, and it equalled seven hours' flying time.

FLIGHT

LIGHT 'PLANE CLUBS

London Aeroplane Club

THE total flying time for the week ending May 15, was 34 hrs. 10 mins., exclusive of the Hampshire Pageant.

Pilot Instructors :—Capt. F. G. M. Sparks and Capt. F. E. N. St. Barbe.

Dual Instruction :—P. W. Hoare, G. Black, Dr. Cook, C. H. Swan, Lord Carlow, H. G. Riches, J. A. Simson, E. R. Wilson, A. S. Mulder, T. Clarkson, E. T. Symmons, E. J. B. King, Miss O'Brien, Mrs. Cook, A. S. Richardson, A. C. Jackaman, H. O. Gugenheim, Miss Fletcher, G. H. Saxon Mills, M. P. Susman, I. H. McClure, Miss Spooner, Miss Wilson, C. L. Harrison, E. A. Lingard, L. Daniels, P. O. A. Davison, A. J. Richardson, J. R. Bell.

Solo Flying :—E. L. Moore, E. S. Brough, O. J. Tapper, G. H. Craig, A. S. Mulder, Major H. Petre, Miss O'Brien, E. T. Simmons, G. Terrell, J. H. Saffery, A. F. Wallace.

Passenger Flights :—B. Merry, Miss Terrell, Miss Clode, L. H. Whiteside, B. N. Whiteside, B. Maurice.

Hampshire Pageant :—The " Bristol " Brownie, piloted by L. J. C. Mitchell, won the Wakefield Light Aeroplane Handicap, and the Club is, therefore, the holder for the first year of the Challenge Cup presented by Sir Charles Wakefield, Bart. The stakes of £50 also go with the Challenge Cup. The " Bristol " Brownie piloted by G. H. Craig secured the third prize of £10 in the President's Challenge Cup Race.

Entrance Fee :—The Committee has decided to impose an entrance fee of £3 3*s.* on all Flying Members joining the Club from now onwards.

Bournemouth Whitsuntide Meeting :—The Bournemouth Whitsuntide Meeting will be held at Ensbury Park Racecourse on June 4 and 6, next. Members of the London Aeroplane Club will be admitted free on presentation of their Membership badges. Motor-cars will be charged 2*s.* 6*d.*

The Bristol and Wessex Aeroplane Club

REPORT for week ending May 14.—Total flying time—Nil ! ! ! However, the Club's " Pixie " is rapidly getting into condition, and will soon be fit to aviate.

A meeting of Members was held at the Constitutional Club, Bristol, on Friday, and was well attended.

Mr. A. H. Downes-Shaw (first Chairman and largely responsible for the organisation of the Bristol Junior Conservative Association) was elected Chairman of the meeting.

Mr. C. Sidney Clarke (organiser of the Club and acting secretary) gave an outline of the position and the progress made. He stated that there were 105 applicants for membership, of whom 65 were anxious to become Pilot Members. One aeroplane (a Parnall " Pixie ") had been given to the Club by Mr. George Parnall, who had also given a substantial subscription and the use of his Yate Aerodrome, with shed accommodation. Mr. Clarke then gave a statement of the financial outlay required to make an early start with flying.

Colonel H. C. Woodcock, M.P., was unanimously elected President of the Club by the meeting, which then proceeded to elect a General Committee as follows :—A. H. Downes-Shaw (Chairman) ; Mrs. D. Hopper ; C. Sidney Clarke ; Flt.-Lt. C. T. Holmes (Instructor, Bristol Aeroplane Co.'s Flying School) ; R. Ashley Hall (an enthusiast with strong local interests and connections) ; P/O. Eric Hopper (A Filton " Nit " famous for a pronounced love of spins and Oxford bags) ; Capt. W. F. Hamilton (late R.A.F., who, being a connoisseur in spirits is now with the B.P. Co.) ; Capt. C. H. Brewer (late R.A.F. and lecturer on aviation, now B.B.C.) ; H. J. Pollard (of the Bristol Aeroplane Co.) ; P/O. J. S. K. Inskip (a Stag Lane " Nit," late President, Cambridge Univ. Aeronautical Society, now a respectable Works Engineer) ; B. W. Townshend (of Parnall's Aircraft Design Staff) ; Arthur Taylor (Hudson, Smith, Briggs & Co., Accountant and Hon. Auditor to Club).

This Committee then sat and elected sub-committees for Finance, Aerodrome and Publicity.

A meeting of the Finance Committee was then held, and a definite scheme for securing adequate support was adopted.

The Hampshire Aeroplane Club

REPORT for week ending May 13th :—Flying was possible on two days only this week owing to gales on Saturday, Monday and Tuesday, and pageant preparations on Thursday and Friday. The total flying time for the two days was 9 hrs. 45 min. ; instruction flying, 4 hrs. 45 mins. ; solo flying, 3 hrs. 20 mins. ; joy rides, 1 hr. 20 mins. ; test flights, 20 mins.

The members who had instruction were Messrs. A. V. Roe, 35 mins. ; Berney, 35 mins. ; Brewster, 30 mins. ; Parker, 30 mins. ; Cox, 40 mins. ; Farmer, 20 mins. ; Dunnings, 15 mins. ; Eburn, 15 mins. ; Simmonds, 10 mins. ; Master Eburn, 10 mins. ; and Miss Home, 25 mins.

The soloists were Bowen, 25 mins. ; Nicholson, 25 mins. ; Lieut. Kimmins, R.N., 20 mins. ; Cooper, 15 mins. ; Hon. H. R. Grosvenor, 15 mins. ; Capt. Yeatman, 15 mins. ; Shepherd, 10 mins. ; Rumble, 10 mins. ; Flt.-Lieut. Crawford, 10 mins. ; Flt. Officer Overbury, 10 mins. ; Flt. Officer Brodie, 10 mins. ; and E. W. Wyllie, 35 mins.

The joy riders were Sergt. Mills, Mr. Baxter, Mr. Alexander and Mr. Bailey of Sky Printers.

On the afternoon of Sunday, May 15, the club endeavoured to entertain approximately thirty-five thousand of the G.B.P., as described elsewhere in this issue.

Midland Aero Club, Limited

REPORT for week ending May 14 :—The total flying time was 10 hrs. 52 mins.

The following members were given dual instruction by Mr. McDonough :—F. Coxhill, E. P. Lane, J. C. Rowlands, D. R. Bednell, C. Burrows, R. L. Brinton, J. Austin.

Advanced dual : H. J. Willis.

Solo : A. M. Glover, R. L. Jackson, H. J. Willis, E. J. Brighton, G. V. Perry.

Passenger flights : Mrs. Willis, J. S. Austin.

Passengers with Mr. Brighton : F. Coxjill, F. J. Whitworth, H. Bolton, R. L. Jackson, R. D. Bednell, G. Lamb.

Passengers with Mr. Perry : H. Leach.

On Saturday Mr. McDonough flew down to Hamble for the Hampshire pageant.

On Sunday Lieut.-Comdr. Graham called in for petrol on a " Moth."

The Lancashire Aero Club

TOTAL for week ending May 14 :—38 hrs. 5 mins. composed of : dual, 11 hrs. 25 mins. ; solo, 8 hrs. 25 mins ; tests, 2 hrs. 15 mins. ; joy rides, 16 hrs. Solo : Costa, 1 hr. 5 mins. ; Nelson 1 hr. 5 mins. ; Twemlow, 1 hr. ; Abdalla, 1 hr. ; Chapman, 55 mins. ; Crosthwaite, 55 mins. ; Lacayo, 30 mins. ; Michelson, 25 mins. ; Hardy, 25 mins. ; Forshaw, 20 mins. ; Dickinson, 15 mins. ; Goodfellow, 10 mins. Dual : Harbor, 1 hr. 20 mins. ; Gerrard, 50 mins. ; Leeming, 50 mins. ; Musgrave, 55 mins. ; Meades, 40 mins. ; Twemlow, 40 mins. ; Ward, 35 mins. ; Pattrieuaoux, 35 mins. ; Fallon, 30 mins. ; Gattrill, 30 mins. ; Torres, 30 mins. ; Nelson, 25 mins. ; Caldecott, 25 mins. ; Cohen, 25 mins. ; Powell, 25 mins. ; Stunt, 20 mins. ; Rowley, 20 mins. ; Race, 15 mins. Barnade, 10 mins. ; Goodyear, 10 mins. ; Abdall, 15 mins. ; Miss Emery, 15 mins.

Joy rides given by Messrs. Brown, Cantrill, Costa, Goodfellow, Stack, Scholes, and Twemlow.

Yorkshire Aeroplane Club

REPORT for the week ending May 15 :—The total flying time was 32 hrs., consisting of dual instruction with Mr. Beck, 18 hrs. 30 mins. ; cross country, 6 hrs. 30 mins. ; aerodrome solo, 5 hrs. 20 mins. ; joy rides, 1 hr. 15 mins. ; tests, 25 mins.

The following members took dual with Mr. Beck : Captain Milburn, Miss Watson, Messrs. Batcock, Miller, Atcherley, Thomson, R. K. Lax, Ely, Yeomans, Brown, Wilson, Swift, Leatham(s)—two varieties, each with the same initial—Ambler, Bramham, Oglesby.

The following flew solo, F. O. Atcherley, Captain Milburn, Messrs Norway, Fielden, Clapham, Wilson, Mann, M. B. Lax, Wood, and Dawson.

On Sunday we sent a Moth to Lancashire, to welcome Mr. Stack. Mr. Mann flew it, with Mr. Swift as navigator. Lunch consumed, we understand that they set off for Sherburn, thinking no evil. Some seventy minutes later the following conversation is reported to have taken place. Pilot : " It's Wakefield, I tell you. I've got an aunt that lives there." Navigator : " It's Pontefract. It says so on the map." Pilot : " Well, anyway, let's put down and ask." Nottingham. Flying time, Woodford to Sherburn, three hours and fifty minutes. We claim this as an inter-club " record."

On Monday we flew Mr. Johnstone, of Layton and Johnstone, to Sheffield. We understand that in this way Mr. Beck secured several more records for the club. Signed ones, too.

Our castle in the air, complete with hard tennis courts, billiard room, palm court, slumber lounge, &c., is materialising quite nicely. Members are requested not to wake the medium.

THE NEWCASTLE AERO CLUB FLYING MEETING

ON June 11 next the Newcastle-upon-Tyne Aero Club will be holding a flying meeting (under the Competition Rules of the Royal Aero Club), at the Cramlington Aerodrome. The following is a preliminary programme of races :—

Private Owners' Handicap

Open to all privately-owned aeroplanes (definition of " privately-owned " is to be at the sole discretion of the Newcastle-upon-Tyne Aero Club). Course, approximately 20 miles. 1st prize, Challenge Cup and £25 ; 2nd prize, £5.

The President's Cup Race

Race for the Pilot Instructors of approved Light Aeroplane Clubs and pilots holding " B " licence flying light aeroplanes. Each type of aeroplane will be handicapped. Course, approximately 20 miles. 1st prize, the President's Challenge Cup (presented by Col. Sir Joseph Reed) and £20 ; 2nd prize, £5.

Open Handicap

Open to all comers. Course, approximately 20 miles 1st prize, £75 ; 2nd prize, £25.

Inter-Club Relay Race

Open to teams of three pilots from each approved club, which may include pilot instructors. Course, approximately 4 miles. Three laps, each pilot flying one lap. 1st prize, Challenge Cup (presented by Messrs. V. S. and J. M. Davidson), and a prize for each member of the winning team.

Inter-Club Members' Handicap

Open to members of approved Light Aeroplane Clubs flying light aeroplanes. Pilot instructors (honorary or otherwise) not eligible. Prize, solid silver Challenge Cup (presented by Mrs. de Lancey Willson).

Completed entry forms must be returned to the Secretary, The Newcastle-upon-Tyne Aero Club, Ltd., Cramlington Aerodrome, Northumberland, by June 4. There are no entrance fees.

Club Items

From Uxbridge, Middlesex, comes news of a club with interests devoted to gliding. The suggestion comes from Mr. C. B. Harris, of Fir Croft, Iver Heath, who served with the R.A.F. and R.A.F.C. during the war and has had considerable flying experience. Associated with him are Mr. T. Crabtree and Mr. S. O. Bradshaw, who is a member of the London Aeroplane Club. Mr. Harris proposes to establish a school with " Moths " and Avro machines, and it is understood that efforts are being made to obtain a suitable site at Iver Heath. In addition to light 'plane flying gliding will also be encouraged.

Yet another club has been founded in Suffolk, whose secretary is Mr. C. N. Prentice, Hazeldell, Stowmarket. Flying has not started yet as far as we know, but it is expected to very shortly.

The Tunbridge Wells Club has now fixed its charges to members at 30*s.* per hour for dual instruction, 20*s.* for solo flying, 25*s.* for a pilot (A) with passenger, and 30*s.* for hire or reward. Membership consists of flying and honorary members and subscription fees are two and three guineas respectively.

AIRISMS FROM THE FOUR WINDS

The Atlantic Flight Mystery

We regret that the safety of the French airmen, Capts. Nungesser and Coli, remains in doubt despite the many rumours that have arisen to the contrary. Systematic searches on both sides of the Atlantic have been organised in vain, and reports of the " White bird's " appearance over Newfoundland about the time it might be expected there on the Monday morning are, unfortunately, discounted now. That a landing in Canada was well within the bounds of possibility is confirmed by the fact that Capt. Coli, the navigator, confided in his friends his intention of directing the " White Bird " there in the event of unfavourable weather on the Atlantic coast. There are contradictory reports of the weather during the vital period on the other side of the Atlantic, and one captain of a liner declares that no 'plane could have lived in the storm which raged to the northward on Sunday night. The elements have considerably interfered with an effective search since. Fleets of aeroplanes have patrolled the American coast; the U.S.A. airship, " Los Angeles," was out; and Atlantic liners diverted from their course to search the presumed path of the lost machine. Also no news has been received of Capt. St. Roman and his companions, who disappeared in the South Atlantic in an effort to span the eastern and western borders on May 5.

The Next Atlantic Attempts

The anticipated competitors for the Atlantic crossing at the moment are now Americans—namely, Capt. Charles Lindbergh, who intends to fly a single-seater Ryan and recently flew it from the Pacific coast to New York in record time; Comdr. Byrd, who is flying a Fokker; and Messrs. Chamberlin and Bertaud, who are using their Bellanca machine in which they set up a recent world's endurance record. Lindbergh is a popular idol on the other side of the Atlantic, partly due to his personality and partly to the risks he is taking by flying alone. Experts favour Byrd, who has three Wright " Whirlwind " engines in his machine and is a very experienced pilot. As all three machines are more or less ready and waiting for fine weather, there is considerable pleasant suspicion among the crews of each trying to forestall the others.

Amsterdam-New York Next ?

A wealthy American, Mr. Van Leer Black, who recently toured Europe by air in one of the Dutch Air Navigation Company's machines, has now ordered a Fokker machine, equipped with three Armstrong-Siddeley " Lynx " engines, and has engaged the Dutch pilot, M. Gejsendorffer, to fly from Amsterdam to New York, probably via England, the Faroes, and Iceland.

Service African Flights

On their homeward flight the South African machines, under the command of Air-Commodore Samson, left Bulawayo for Livingstone on May 10, and arrived at N'dola on May 13. Kisumu was reached on May 15 from Tabora, and Mongalla, in the Sudan, on May 17.

Flying Home from India

Flying-Officer J. J. C. Cocks, No. 60 (Bombing) Squadron, R.A.F., left Lahore, India, May 11, in a privately-owned D.H.9 biplane fitted with a 240-h.p. Siddeley Puma engine, *en route* for Lympne, England, via the Persian Gulf, Iraq, and Asia Minor. He was accompanied by Corporal Rowston, R.A.F. He hoped to start on the next stage from Karachi last Saturday.

Schulz makes another Gliding Record

On May 14, at a gliding competition, the German, Herr Ferdinand Schulz, succeeded in gliding a distance of over 38 miles along the coast from Rositten to Memel, establishing a gliding record. The previous record was also made by a German, Max Kegel, who flew 34 miles in a straight line last August.

Pinedo's Progress

The Marquis de Pinedo reached Philadelphia from New York on May 11 and flew from Charleston to Pensacola, Florida, arriving next at New Orleans on May 13. The next day he reached Memphis, Tennessee. The last landing in the United States was made when he alighted at Chicago on May 15, where, in a speech, he expressed his thanks to the American people for the friendship shown him during his trip. He intended to leave the next day for Montreal, but engine trouble caused a delay; eventually he arrived on the evening of May 17, after 11 hrs. flying. From Montreal he will fly to Newfoundland and then cross the Atlantic to the Azores.

A Supermarine Extension

The Supermarine Aviation Company, Southampton, have acquired the Hythe seaplane shed adjoining the works of Messrs. Kemp and Co., Hythe, near Southampton. It was built by the Government during the war for the purpose of erecting seaplanes and flying boats, although very little of this work was actually done, and for years it has laid idle. It is to cope with the extension of their business that the famous flying-boat constructors have taken the huge shed, as it will give them adequate facilities for large contracts. It will be used mostly for erection and the testing of machines. It is already occupied by them, and some hulls were sent over from the Woolston works this week. It is situated on the shore at Hythe, within convenient distance of the new Fawlay-Totton railway line, and affords an excellent slipway for launching boats.

Fatal French Air Collision

In an accident near Metz on May 10, four French airmen were killed. Seven aeroplanes of the 11th Aviation Regiment were engaged in formation flying when two rear machines came into collision and crashed to earth from less than 500 ft. There was no chance of the parachutes being used, and the one officer and three N.C.O.'s were killed instantly.

Missing Russian Balloonists Rescued

The pilots of a Soviet balloon which went up from Moscow on April 30 have been rescued by hunters twenty miles from Troitsk in the Komi district. They were found half frozen and nearly dead from exposure. The balloon met with disaster when flying over the Ural mountains.

Pan-American Air Conference

The Pan-American Commercial Aviation Conference which is meeting at Washington has come to two interesting decisions, which are not altogether in agreement with the desires of the U.S.A. One is to the effect that commercial aircraft shall have the nationality of the State in which they are registered. This strikes away limitations of the character included in the International Air Convention of 1919. The second decision made was the total prohibition of the transport by commercial aircraft of arms, munitions, or explosives. Objections to this decision were made on the grounds that it would prevent the sending of explosives by air urgently required by mining concerns, etc. Arguments for this decision were based on the question of revolutions breaking out in certain States. The conference is also considering the drawing up of a convention to regulate commercial flying between the United States and countries to the south.

Paris-Moscow by Light Plane.

On May 17 Lieut. Thoret set out from Le Bourget in a Caudron " Avionnetti " (40 h.p. Salmson) in an attempt to fly to Moscow. He was, however, forced to descend shortly after starting in order to make certain adjustments, but arranged to make another attempt at the first opportunity.

Proposed Vancouver-Sydney Flight

Proposals have been made for a flight from Vancouver to Sydney, Australia; *via* Honolulu, Fanning Islands, Suva, and New Caledonia, a total distance of about 7,400 miles. It will be undertaken next summer by Capt. F. A. Giles, late R.A.F. navigator, and Capt. G. Jenkins, pilot.

R. Ae. Society's Chairman

Colonel the Master of Sempill has been re-elected Chairman of the Royal Aeronautical Society as from October, 1927, to September, 1928. Thus to hold office in that important capacity for two years in succession is a precedent.

FLIGHT

SOME COMMERCIAL ASPECTS OF AIR SURVEY

BEFORE a large gathering, which included the Colonial Governors, now in conference in London, Maj. Hemming, of the Aircraft Operating Co., gave a lecture on " Air Survey " before the Institution of Aeronautical Engineers, at the Royal Society of Arts on May 12. Sir William Clark was in the chair. Maj. Hemming said that one of the few benefits derived from the war was the development of aerial photography to a stage where it could be of great value for exploration and mapping work, but this side of civil aviation was left to private enterprise as the authorities only concentrated their efforts on air transport. Canada was the first to realise the importance of the aeroplane and the air camera, and they developed air surveying and forest fire fighting, leaving air transport to other countries. Their policy was soon justified, and thousands of square miles had been mapped from the air. Private air survey companies had sprung up and their Air Survey Department was undoubtedly the finest in the world, whilst they had saved millions of dollars from the forest fire menace. The country bore the expense of the pioneering work, and when the industry could be self-supporting private companies were formed to whom they gave contracts. Thus commercial aviation was assisted but without the subsidies. Although Canada had taught us much, we in England had to pay for that education as the official support in Canada, coupled with developments in America, resulted in new and improved aerial cameras and air survey aeroplanes on that side of the Atlantic. The aircraft trade (with one exception) and the instrument trade in this country failed to grasp Canada's requirements, with the result that today the American camera was used as a standard type by the Royal Canadian Air Force and by most of the Canadian companies, and that camera had undoubtedly given excellent service. True, the " Eagle " camera had been produced in this country now, and they thought it a great improvement on the American camera, but the Americans had got in first. Messrs. Vickers, however, showed fine enterprise and had produced seaplanes for air survey work built to the specifications of the Canadian authorities, otherwise he believed that apart from British aeroplanes of the war period most other aircraft used on the survey work in Canada were American. While air survey progressed in Canada our Government gave their attention to air transport. Shortly after the war a British company sent an air survey expedition under the command of Maj. Cochran Patrick to the Orinoco Delta in Venezuela and to British Guiana, where usefnl work was done. Much private money was lost, through no fault of the company, and valuable experience gained. While no financial assistance was given by the Air Ministry, various members of the Ministry went out of their way to help this first British air survey expedition abroad, and in particular Wing-Commander Laws. At this time Prof. Melvill Jones and the late Maj. Griffiths were carrying out valuable practical research work in air surveying at Cambridge with the aid of the R.A.F. It was as a result of both these activities that the Irrawaddy contract was secured, which was a complete success, and was followed by several others. Today both the British companies engaged in this work had plenty of work to do. Also, thanks to the Air Survey Committee, the airman and the ground surveyor were closely co-operating. The civil section of the Air Ministry, too, had been of great assistance, their chief, Sir Sefton Brancker, having spread the gospel of air survey abroad. Much was owed to the sympathetic attitude of the Press and to the essential part played by the British Aviation Insurance Group.

The introduction of the film camera specially designed for the work had reduced costs and its suitability was fully demonstrated on the Ordnance Survey Revision contract carried out with the F.8 type lent by the Air Ministry. The commercial edition had since then become available, known as the " Eagle " type, and was at present being used by them on the Northern Rhodesian air survey. It had many improvements on the old type as it automatically photographed certain valuable data on each negative, thus saving much laborious and difficult work. He was convinced that the requirements of air surveying had to be reduced to a simple operation. It should not be necessary for the pilot to steer by optical sights, although these were at present valuable for partially overcoming the bad view which was inherent in the tractor aeroplane when used for the work. It was hoped shortly to build a special machine which would, he thought, materially reduce costs and increase output. Some important problems had to be solved, and one of the biggest was the separating of the practical and theoretical methods of mapping from air photographs. Methods had been investigated. A successful experiment by Lieut. Hotine for the Air Survey Committee had shown that contour maps on a large scale could be made from vertical overlapping air photographs with the aid of the stereoscope, and a certain number of spot heights established on the ground.

Air surveying was self-supporting to-day, a status which it had achieved without the aid of a subsidy. Its greatest claim as a commercial service was its ability to accomplish work in most unmapped parts of the globe far more quickly and cheaply than by the ground method. Contracts were regularly being undertaken in this country with every satisfaction. Definite tenders could now be given for a contract, and it could be executed on a contract basis. Maj. Hemming then read extracts of reports on different completed contracts, which proved the great success of the air survey ; and then spoke of quotations, remarking that the size of the area had an important bearing on the cost, as the bigger the area the smaller the cost per square mile. He concluded a very interesting lecture by referring optimistically to the future, and showed illustrations with excellent lantern slides of an expedition at work on their Northern Rhodesian contract.

The Discussion.

Opening the discussion, the chairman said that he could not speak with much experience either of the aeroplane or the camera, but he saw most clearly from the interesting lecture an example of the application of aviation which was a success without official financial assistance.

Lord Thomson said that he was glad to take the opportunity as the first of the audience to thank Maj. Hemming for his lecture. It was a most noteworthy fact that air survey was a branch of civil aviation self-supporting. He did not think he had listened to a paper that had proved its case so well, and the lantern slides definitely clinched it for him. He would conclude to give way to experts.

Sir Graeme-Thomson, Governor of Nigeria, said that he had no expert knowledge of flying, but he could see that air survey would be of utmost importance to the Colonies.

Sir Sefton Brancker said he congratulated the Institution of Aeronautical Engineers on the nature of the lecture when the Governors of the Colonies were here. He had tried to sell air survey as hard as he could, but he had been at a great disadvantage without knowledge of costs. He said that mud had been thrown at the Air Ministry, but he pointed out that air survey had boomed without the subsidy, and he would compare this with the position of civil transport, which had the subsidy. Air Transport was a necessity but it did not pay yet, and until it did the taxpayer would have to bear the burden. It was a healthy sign if progress was made without the subsidy. We owed much to the pioneers in air survey like Hemming, Kemp and Cochran Patrick, and those who had helped in a financial way like Mr. Alan Butler. We had to express our congratulations to Canada for leading the way. Referring to the fact that America had stepped in before us in Canada, he said that was because in America they ran before they could walk. but they got good results, whilst we tried for perfection first. Nevertheless, we usually got there in the end. He felt that a boom was coming in air survey, and he advised the Colonics to get in quickly before the companies were too busy. It was necessary to have big jobs though to warrant sending expeditions to these far spaces. He was sorry he was unable to visit the work of the Aircraft Operating Company in Rhodesia when he was there. He wanted to and would have done so if only there had been an aeroplane to take him, for he could have done the journey in a day. It only convinced him all the more of the need for air transport in those great areas.

Sir Gordon Guggisburg, Governor of the Gold Coast, said that he had had fourteen years surveying on the Gold Coast and he was convinced there was an enormous future for the air survey. There was the question of cost, which all depended on the size and amount of work to be done. On the Niger Delta they tried a ground survey from 1910 to 1914, but it was not successful, and the only way it could have been done was by air. He thought that air survey was a necessary preliminary to the laying down of railways and roads.

Maj. D. A. Hutchison said that it was essential that Governments should see that a map was necessary before any developments took place in a country. He did not think that air survey would take the place entirely of ground work, for there were certain limitations. For instance, it needed a ground surveyor to get the names of the places which were not recorded by air survey. He felt there was a need for the co-operation of both.

Col. Ryder said he spoke from a different angle of vision as he had been a ground surveyor for 36 years. He believed in the future of the air work but did not think it would replace the other. Ground survey would always be necessary, and it would hold its own always in some countries. He pointed to the advantage of the air work when fever-infested areas had to be covered.

Col. Crosthwait also congratulated Maj. Hemming, and the evening closed with a vote of thanks to the lecturer and the chairman, Sir William Clark.

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The Inst. Ae.E. Aviation Ball

THE Institution of Aeronautical Engineers has arranged an Aviation Ball on June 30 at the May Fair Hotel. All profits accruing are to be given to the " National Fund for the Promotion of Aeronautics," the Trustees of which are Capt. the Rt. Hon. F. E. Guest, Lord Ossulston and Mr. E. Soanes Lendrum. The object of this fund is to encourage civil aviation in this country. On May 23 the Institution is also holding a lecture at the Royal Society of Arts on " Heat Resisting and Non-Corrodible Steels " by Mr. S. A. Main. The chair will be taken by Colonel N. Belaiew. Admission is free and without ticket.

THE WILBUR WRIGHT MEMORIAL LECTURE

"The Generation of Vortices in Fluids of Small Viscosity"

THIS year's Wilbur Wright Memorial Lecture was read on May 16 before the Royal Aeronautical Society of Great Britain by Prof. Dr. L. Prandtl, of the Göttingen Laboratory, Berlin. This is the first time in the history of the R.Ae.S. that this lecture has been delivered by a lecturer from outside Anglo-American circles, and the occasion was marked, in addition, by the presentation of the Gold Medal of the R.Ae.S. the highest distinction which the Society has to bestow, to Dr. Prandtl, and the Society's Silver Medal to Prof. B. Melvill Jones of Cambridge University. Chairman of the meeting was Col. the Master of Sempill, Chairman of the R.Ae.S., who, in introducing the lecturer, drew attention to the importance of the phenomenon of vortices and to the great work carried out by Dr. Prandtl on the building up of theories relating to the generation of vortices and their relation to aerofoil theory. He also made the interesting statement that Dr. Prandtl had learned English after receiving the invitation to read the Wilbur Wright lecture.

Prof. Prandtl personally read the introduction to his paper, but asked to be excused from reading the entire paper, as it was thought that if the paper were ready by Major Low, who had translated it, a certain amount of time might be saved. Prof. Prandtl referred to the origin of the "Lanchester-Prandtl aerofoil theory," and explained that the popular belief that he (Prandtl) got the ideas on which his theory was based from Lanchester's work "Aerodynamics," published in 1907, was wrong. The necessary ideas upon which to build up the theory had occurred to him before he saw Lanchester's book. Having already thought along similar lines, when Lanchester's work appeared, the Germans were able instantly to grasp his meaning, while in England this was not the case, Lanchester's treatment making a considerable demand on the reader's intuitive perception. At the same time he admitted that in many respects Lanchester worked along different lines, and that consequently German scientists were able to obtain many useful ideas from Lanchester's work.

Maj. A. R. Low then read the main paper, the title of which was "The Generation of Vortices in Fluids of small Viscosity." It is not possible usefully to summarise the paper, which should be read in its entirety. The lecture was illustrated by a number of lantern slides and cine films illustrating the formation and development of vortices, and there is little doubt that the illustrations did a good deal towards stimulating a general understanding of the circulation theory which hitherto has not, we fear, been given a great deal of attention in this country outside a few scientists who have been directly concerned in the subject.

As in the case of previous Wilbur Wright Memorial Lectures, no discussion followed the reading of Dr. Prandtl's paper, but the Chairman asked Sir Sefton Brancker to propose a vote of thanks to the lecturer, and Mr. Lanchester to second it.

Sir Sefton Brancker took for his theme the development in art and science. The former appeared to have reached the limits of development, and if modern painters or composers attempted to improve upon what had been accomplished in the past the result was usually disastrous. Not so with science. Progress in aviation depended upon research, and Germany had been foremost in that field. He hoped the appearance of Dr. Prandtl was indicative of the coming of close co-operation between the two great countries Britain and Germany.

Mr. Lanchester did not quite agree with Sir Sefton Brancker on the subject of art and science. The one was creative while the other was mainly a question of discovery. If there had never been a Wagner we should never have had the equivalent of the great works of that composer. If Newton had never lived, scientific progress might have been delayed, perhaps a hundred years, perhaps two hundred years, but someone else would, sooner or later, have come along and done what Newton did. While the great composers and painters were gods on high, scientists occupied a much less exalted position. They had, however, their small uses (laughter) and among them Dr. Prandtl occupied a very prominent place.

Prof. Prandtl was the guest of honour, after the lecture, at a dinner given by the Royal Aeronautical Society at the Athenæum. Among those present were :—

Air Vice-Marshal Sir W. Sefton Brancker (president), Colonel the Master of Sempill (chairman), the following members of the Council : Captain P. D. Acland, Mr. A. E. L. Chorlton, Mr. C. R. Fairey, Major A. R. Low, Mr. F. Handley Page, Mr. R. McKinnon Wood, Mr. H. E. Wimperis, Mr. Griffith Brewer, Wing-Commander T. R. Cave-Browne-Cave, Captain G. T. R. Hill, Mr. J. E. Hodgson, Mr. H. B. Irving, Major R. H. Mayo, Lieut.-Colonel M. O'Gorman, Mr. T. O. M. Sopwith, Air Vice-Marshal Sir Vyell Vyvyan, and Mr. H. C. Watts ; and the following guests : Prof. L. Bairstow, Mr. H. Glauert, Sir Richard T. Glazebrook, Air Vice-Marshal Sir John Higgins, Prof. F. W. Lanchester, Sir Francis McClean, Mr. R. V. Southwell, and Herr Dieckhoff, Counsellor of the German Embassy, representing the German Ambassador.

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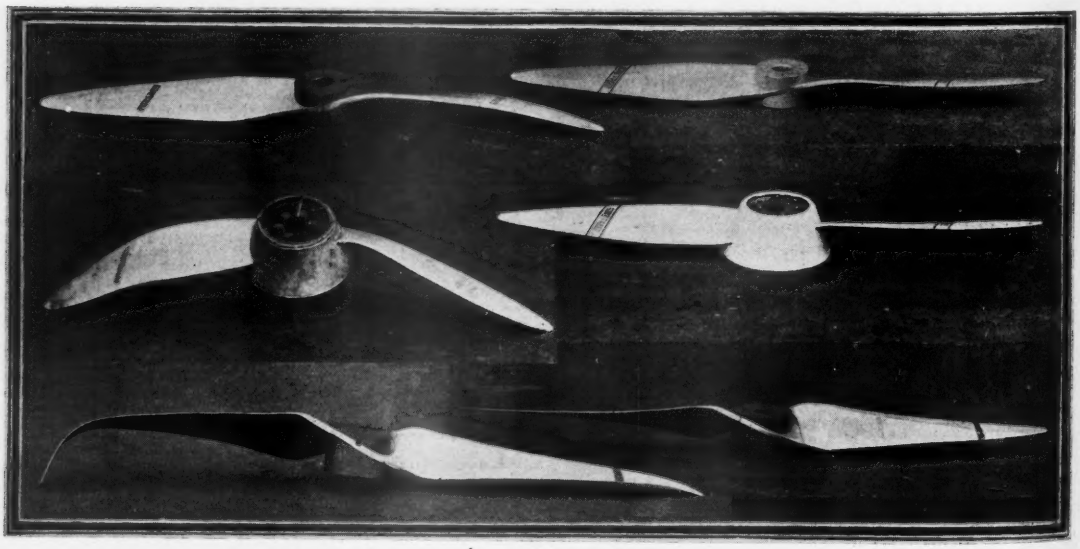

BEFORE AND AFTER : We show above some interesting photographs of three Fairey-Reed metal airscrews which, as indicated on the left, have been somewhat deranged through bad crashes. After a visit to hospital, however, they return to service "as good as new," as shown on the right. A wooden airscrew under similar circumstances would undoubtedly have been destroyed

FLIGHT

THE ROYAL AIR FORCE

London Gazette, May 10, 1927

General Duties Branch

No. 137439 Sgt. A. E. J. Pratt is granted a permanent commn. as a Pilot Offr. on probation, with effect from and with seny. of May 2. The following Pilot Officers are promoted to rank of Flying Officer :—G. Bradbury (March 12); W. E. Barnes, H. C. G. Dauncey, T. F. Maloney, R. T. Read, J. T. Riggs, L. G. Rumsey (March 26); G. W. Tuttle, E. G. Cayley, R. E. Hall, P. R. Barwell, F. G. Downing, C. H. Jones, W. L. Whitlock (March 28).

Squadron-Leader T. H. England, D.S.C., A.F.C., is placed on retired list at his own request, (May 4); Flying Officer J. H. Slater, M.B.E., is placed on retired list at his own request (May 11); Flight-Lieut. R. A. Birkbeck, D.F.C. is transferred to Reserve, Class A (May 12); Flight-Lieut. G. H. Allison is transferred to Reserve, Class A (Dec. 12, 1926) (substituted for *Gazette*, Dec. 14, 1926); Flying Officer C. S. Philpott (Lieut., Cheshire Regt.) relinquishes his temp. commn. on return to Army duty (April 24).

Stores Branch

Flight Lieut. F. S. Moore is transferred to Reserve, Class B (May 12).

Accountant Branch

The permanent commn. of Pilot Officer on probation C. M. Johnson is terminated on cessation of duty (May 11).

Reserve of Air Force Officers

The following are granted commns. in Class A.A., General Duties Branch, as Pilot Offrs. on probation : S. J. Barlow (April 25); G. A. R. Malcolm (April 26); R. P. S. Taylor (April 27); J. P. Rae (April 28). The following are granted commns. in the General Duties Branch, Special Reserve, as Pilot Offrs. on probation :—D. G. Allison (April 23); R. H. Maw, N. D. Wardrop (May 2). Pilot Officer F. R. Matthews is promoted to rank of Flying Officer (May 9); Flying Officer B. A. Davy is transferred from Class C to Class A (April 16). The following are transferred from Class A to Class C :—Flight-Lieut. M. D. Nares, A.F.C. (May 10); Flying Officer A. J. C. Overal (April 21). Flying Officer C. Dattson resigns his commn. (May 10).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified :—

General Duties Branch

Group Captains : J. A. Chamier, C.B., C.M.G., D.S.O., O.B.E., to R.A.F. Depot, Uxbridge, 1.4.27. J. A. Chamier, C.B., C.M.G., D.S.O., O.B.E., to Air Ministry, Directorate of Technical Development, on appointment as Deputy Director of Technical Development, 6.5.27. H. M. Cave-Browne-Cave, D.S.O., D.F.C., to H.Q., Coastal Area, Supernumerary, 6.5.27.

Wing Commanders : S. Grant-Dalton, D.S.O., A.F.C., to Armament and Gunnery Sch., Eastchurch, to command, 6.5.27. E. H. Johnston, O.B.E., D.F.C., to R.A.F. Depot, Uxbridge, 6.5.27.

Squadron Leaders : D. E. Stodart, D.S.O., D.F.C., to R.A.F. Depot, Uxbridge, 26.3.27. E. R. I. Corballis, D.S.O., O.B.E., to R.A.F. Depot, Uxbridge, 9.4.27. E. R. I. Corballis, D.S.O., O.B.E., to No. 22 Sqdn., Martlesham Heath, 3.5.27. A. S. C. S. MacLaren, O.B.E., M.C., D.F.C., A.F.C., to H.Q., Inland Area, Stanmore, 9.5.27. D. F. Stevenson, D.S.O., M.C., to H.Q., Air Defence of Great Britain, Uxbridge, 10.5.27. J. Noakes, A.F.C., M.M., to R.A.F. Depot, Uxbirdge, 9.4.27.

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AIR MINISTRY NOTICES TO AIRMEN

Index.—May 1, 1927

IT is notified that the index dated October 15, 1926, is cancelled and a new list substituted therefor :—

Operative Notices.

The Notices to Airmen hereunder will remain operative until further notice. To facilitate reference an indication of the principal contents of a Notice is given if this is not made clear by the title. If part of a Notice has been cancelled this also is indicated.

General

(1922).—82. Pilots' licences (Class "B"): Extension of licences to cover further types of flying machines.

(1924).—8. Periodical internal inspection of fabric-covered components. 35. Engines in civil aircraft: Running speeds. 61. Conditions under which aircraft are required to carry wireless apparatus and a licensed wireless operator, and conditions as to the use of wireless apparatus. 114. Publication of "The Air Pilot: Gt. Britain."

(1925).—52. Forced landings of aircraft not equipped with W/T apparatus on cross-Channel flights. 54. Radio-goniometric (D.F.) Service on civil air routes: Great Britain, Belgium, France and Holland. 58. Croydon Aerodrome: Building operations, etc.

(1926).—1. The Air Navigation (Amendment) Order, 1925. 12. Croydon Aerodrome: Obstructions (*see also No.* 50 *below*). 17. Fitting of safety belts. 27. Upavon Aerodrome; Obstruction. 31. Renfrew Aerodrome: Work in progress. 50. Croydon Aerodrome: Obstructions. 51. Kite W/T aerials: General warning. 54. Hendon Aerodrome: Obstruction. 56. Parachute descents from civil aircraft. 58. R.A.F. procedure for starting aeroplanes. 59. Gosport Aerodrome: Obstruction. 64. Andover Aerodrome: Erection of W/T masts. (*Para.* 1 *cancelled.*) 70. Andover Aerodrome: Obstructions. (*Para.* 1 *cancelled.*) 72. Air Navigation Directions, 1926 (A.N.D. 6). 76. Procedure for obtaining single bearings by D/F, W/T. 80. Revised Notes on the licensing of private pilots (Class A Licences) and the flight of private flying machines. 81. Croydon Aerodrome: Neon tube experiments. 82. Civil air navigators: Regulations for the issue of licences. 83. Fitting of safety belts.

(1927).—2. Parachute descents from civil aircraft. 5. Obstructions at aerodromes. (*Paras.* 2 *and* 3 *cancelled.*) 9. Basingstoke-Woking: Temporary danger area. 11. Precautions against collision during foggy weather 12. Farnborough Aerodrome: W/T Masts. (*Para.* 2 *cancelled.*) 14. Eastchurch: Obstruction. (*Paras.* 1 *and* 2 *cancelled.*) 17. Night Flying near Farnborough. 20. Aintree Aerodrome (Liverpool): Landing forbidden. 22. Gosport Aerodrome: Obstruction. 25. Air Navigation (Amendment) Order, 1927. 29. Government-owned Aerodromes: Prices of petrol, etc. 30. Publication of Information in Notices to Airmen and the Air Pilot-Monthly Supplement. 32. State of Aerodromes. Lympne air light out of action. 33. Hythe: Danger area. 34. Croydon Aerodrome: Landing zones.

Particulars are also given of the notices which are still operative in the various foreign countries.

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Royal Air Force Stores Officers

THE Air Ministry announces that 15 to 20 vacancies for permanent commissions in the Stores Branch of the Royal Air Force will be offered for competition among young men between 23 and 25 years of age who have not less than five years' business experience in a firm of standing. This is the second competition under the scheme initiated last year to obtain men with a business training to control and administer the supply of the highly valuable and complex equipment of the Royal Air Force.

From among applicants a limited number will be selected to sit for an examination in the light of the information furnished by them and by gentlemen whom they will be asked to name as referees. The examination will be held in London and will consist of two parts, an interview before a board and a written examination in English, general knowledge and arithmetic. The written examination will be of such a character that men of good general education can take it without special study.

Accepted candidates will be gazetted to commissions as pilot officers on probation and will receive six months' training in their future duties. After a year's satisfactory service, they will be eligible for confirmation in their appointments and for promotion to the rank of flying officer. Promotion above the rank of flying officer will be by selection.

The pay of a pilot officer in the Stores Branch is 12*s.* 2*d.* a day, and, including the value of allowances which may be provided in kind or in cash, the total emoluments amount at present to approximately £365 a year. The similar figure for flying officers on promotion will be £491 and for group captains (the highest rank for which provision is made) £1,140. The expenses in Royal Air Force messes are strictly regulated so that officers even of the most junior rank can live on their pay. Rates of pay are subject to variation in accordance with the cost of living. The appointments are pensionable.

Enquiries for copies of the regulations and for application forms should be made in writing to the Secretary, Air Ministry, London, W.C.2. Completed application forms should reach the Air Ministry not later than May 23.

Air Gunnery and Bombing Ranges : Holbeach, Donna Nook, and Stert Flats, Bridgwater

IT is notified :

1. Air Gunnery and bombing practice, which takes place within the areas and during the periods detailed below, forms a danger to aircraft, except when flying above the minimum safety height specified. No liability for accidents arising to aircraft from the use of the ranges in these areas will be admitted. No special warning signals for aircraft will be displayed, but the usual flag signals will be employed at certain points whenever practice is in progress.

A. THE WASH, HOLBEACH, LINCOLNSHIRE.

Description and Position.—An irregular shaped area, dimensions approximately 3½ miles × 3 miles. Situated on the coast (in the Wash) and extending seawards, the centre of the area being approximately 9 miles N.E. of Holbeach, Lincolnshire.

Programme of Firing.—Daily, Sundays excepted, until September 30, 1927, as follows :—

Mondays to Fridays (inclusive), 0700 to 1800; Saturdays, 0700 to 1200; minimum safety height above sea level, 14,000 ft.; warning signals, red flags.

B. DONNA NOOK, LINCOLNSHIRE.

Description and Position.—An irregular shaped area, dimensions approximately 5 miles by 4 miles. Situated on the coast and extending seawards, the centre of the area being approximately 13 miles S.E. of Gt. Grimsby, Lincolnshire.

Programme of Firing.—Daily, Sundays excepted, until September 30, 1927, as follows :—

Mondays to Fridays (inclusive), 0700 to 1800; Saturdays, 0700 to 1200; minimum safety height above sea level, 14,000 ft.; warning signals, red flags;

C. STERT FLATS, BRIDGWATER, SOMERSET.

Description and Position.—An irregular shaped area, dimensions approximately 4 miles × 3 miles. Situated on the coast and extending seawards, the centre of the area being 7 miles N.W. of Bridgwater, Somerset.

Programme of Firing.—Daily, Sundays excepted, until September 30, 1927, as follows :—

Mondays, Wednesdays, Fridays and Saturdays, 0830 to 1800 hrs.; Tuesdays and Thursdays, 1000 to 1800 hrs.; minimum safety height above sea level, 14,000 ft.; warning signals, red flags. (*No.* 38 *of* 1927.)

Obstructions at Kenley and the River Medway. Lympne Air Pilotage Light

IT is notified : (1) Kenley.—Two W/T masts, 60 ft. high have been erected at the south boundary of the aerodrome. The masts are marked by night with red lamps. (723625/26.)

(2) River Medway.—Pilots who may alight on the River Medway are warned that two masts, 100 ft. high, carrying an electric cable across the river, have been erected 700 yards S.S.W. of Cuxton and 3 miles above Rochester Bridge. (762891/27.)

(3) Lympne.—The air pilotage light is again in operation. (758777/27.)

(4) Paragraph (3) confirms W/T signal of May 10, 1927, and cancels paragraph 3 of Notice to Airmen No. 32/1927. (No. 39 of 1927.)

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The Health of the Royal Air Force

THE official Blue Book on the Health of the Royal Air Force, for the year 1925, has just been issued. While the report shows that there was still a high percentage of sickness, there was a decrease in the period under review as compared with previous years. The average strength of the Air Force as a whole (in 1925) was 33,028, and the total number of cases of sickness recorded was 29,763, equivalent to a case incidence of 901·1 per 1,000 of strength. The incidence of sickness and the number of days of sickness per head are the lowest that have been recorded since 1920, when these Reports were instituted. Injuries due to flying are recorded as 155 with 55 deaths; injuries sustained in athletics as 851, with 5 deaths; and motor transport was responsible for 400, with 18 deaths. A total of 36 deaths from disease is recorded.

IN PARLIAMENT

Royal Air Force Indian Units

Mr. RILEY, on May 9, asked the Under-Secretary of State for India the direct expenditure by the Government of India, during the last five years on the pay and maintenance of Royal Air Force units in India and what part of this expenditure is votable by the Indian Legislature?

Earl Winterton: The total expenditure by the Government of India during the last five years, on the pay and maintenance of Royal Air Force units in India, including all payments made to the Air Ministry, has been nine crores eighteen lakhs of rupees, or an average of about £1,320,000 a year. No part of this expenditure is votable by the Indian Legislature.

Bournemouth Flying Meeting

COL. DAY, on May 11, asked the Secretary of State for Air whether any of the pilots or mechanics taking part in the flying meeting at Bournemouth on Monday, April 18, were members of the Royal Air Force; whether any materials or machines belonging to the Royal Air Force were used on this occasion; and, if so, whether any damage was caused to any of the machines so used?

Sir Philip Sassoon: As regards the first part of the question, a number of Royal Air Force officers flew in the competition, but not on service machines, and the answer to the remaining parts of the question is in the negative.

Col. Day: Is it necessary for pilots to obtain special permits before taking part in these pageants?

Sir P. Sassoon: Yes, sir.

Privately Owned Aircraft

LIEUT.-COMDR. KENWORTHY asked how many privately owned aircraft there are in Great Britain and Northern Ireland licensed to fly, apart from the aircraft owned by the companies drawing a subsidy from the Government; and how many of these former are light aeroplanes?

Sir P. Sassoon: The number of civil aircraft with valid certificates of airworthiness, excluding those owned by the Air Council, by Imperial Airways, Ltd., and by subsidised light aeroplane club companies, is 138; of these 36 are light aeroplanes.

R.A.F. Stores and Material Sales

REAR-ADMIRAL BEAMISH asked what amounts have been received from sales of airship stores and material during the years 1925 and 1926?

Sir P. Sassoon: The receipts were, approximately, £8,800 in 1925 and £2,990 in 1926.

Airships

REAR-ADMIRAL BEAMISH asked the Secretary of State for Air (1) if there is more than one mooring mast in England suitable for the R.100 and R.101; and is it contemplated, or possible, that both vessels can use one mast simultaneously; (2) if it is proposed to handle the R.100 for trials at Howden without any mooring-mast at that station; and does he propose to erect a mooring-mast at that place, and, if not, will the mooring mast at Cardington be available for R.100 directly the ship is ready for trials?

Sir P. Sassoon: There is only one mooring mast in England suitable for the R.100 and R.101—namely, that at Cardington, and it is not proposed to erect a second at Howden. The Cardington mast can be used by both airships, but not simultaneously; it is not contemplated that they will be in the air for their trial flights at the same time or that difficulty will in practice arise in regard to the availability of the mast for either airship when ready. For the trials, I think, the one mast is sufficient. We hope to have both the Howden airship and the Cardington airship flying next year.

Sir F. Hall: Supposing it is necessary to have both in the air simultaneously what protection will there be for the two airships if they should require separate masts?

Rear-Admiral Beamish: Is it not necessary to ballast these large airships, when they are secured to mooring masts, before they can be replaced in their sheds; and, if that be so, and if these two ships are to do trials simultaneously, how are they to get back to their sheds unless they are ballasted at the mooring masts?

Sir P. Sassoon: We will not have them in the air simultaneously.

Mr. Wells asked what amount of the sums of £31,650, £36,000, and £39,750 spent upon salaries of officials, designers, and draughtsmen at Cardington in the years 1925, 1926, and 1927 respectively, are included in the sum of £260,000 stated to have been expended upon experimental work in connection with the proposed airship R.101?

Sir P. Sassoon: Of the amounts quoted by the hon. Member, sums of £7,630, £13,540, and £20,000 respectively may be taken as chargeable against R.101 in respect of design, and £2,710, £6,010, and £14,120 respectively in respect of overheads.

Aircraft Subsidies

LIEUT.-COMDR. KENWORTHY, on May 12, asked how many aircraft licensed to fly are owned by the companies drawing a subsidy from the Government?

Sir Samuel Hoare: Forty aeroplanes, 20 being owned by Imperial Airways, Ltd., and 20 by the subsidised light aeroplane clubs.

Aerial Display, Southampton

COL. DAY asked the number of aircraft of both land and sea types belonging to the Royal Air Force that will participate in the aerial pageant to be held on the Hamble, Southampton, on May 15, and the approximate number of aircraft personnel that will be employed in this pageant?

Sir S. Hoare: The answer is that six single-seater fighter aeroplanes, three Southampton flying boats, 13 officers, and 21 airmen of the Royal Air Force will participate in the display in question. In addition, one single-seater fighter aeroplane, three two-seater or multi-seater aeroplanes, two seaplanes, six officers, and five airmen will visit the display.

Malta and Commercial Aircraft Facilities

SIR GERALD STRICKLAND, on May 16, asked the Secretary of State for Air whether he had considered the opportunities offered by Malta as a centre for fuelling commercial aircraft; what steps are being taken to add to landing places available for commercial liners; and whether he will consider arrangements for allowing the restricted use of military places for civil purposes?

Sir Samuel Hoare: The answer to the first part of the question is in the affirmative. As regards the second and third parts, only Service landing grounds have so far been provided in Malta, but all requests for the use of Air Force facilities for civil air traffic purposes are sympathetically considered and granted wherever this can be done without detriment to Service requirements.

* * * *

Marquis of Clydesdale joins Bombing Squadron

THE Marquis of Clydesdale, the amateur boxer, who is the son of the Duke of Hamilton, has joined the Glasgow Territorial Bombing Squadron as a pilot officer. He is training at Stag Lane Aerodrome, and is expected to qualify in six weeks, and will then be attached to the squadron.

IMPORTS AND EXPORTS, 1925-1926

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910).

For 1910 and 1911 figures see FLIGHT for January 25, 1912.

For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1926 being given in FLIGHT, January 20, 1927.

	Imports.		Exports.		Re-Exports.	
	1925.	1926.	1925.	1926.	1925.	1926.
	£	£	£	£	£	£
Jan. ..	494	1,850	130,049	49,021	—	—
Feb. ..	2,089	679	40,416	63,080	6,341	—
Mar. ..	1,001	7,087	92,840	106,478	9,758	2,270
Apr. ..	536	822	160,832	71,190	5,051	785
	4,120	10,438	424,137	289,769	21,150	3,055

* * * *

PUBLICATIONS RECEIVED

The Petrol Engine. 2nd Edition. Temple Press, Ltd., 7-15, Rosebery Avenue, London, E.C.1. Price 3*s.* 6*d.* net (post free 3*s.* 10*d.*).

A Note on Bumpiness at Cranwell, Lincolnshire, during the Period December 1, 1925, to April 30, 1926. By W. H. Pick and G. A. Hull. Meteorological Office Professional Notes No. 46. H.M. Stationery Office, Kingsway, London, W.C.2. Price 3*d.* net.

"No Sulphation." Tungstone Accumulator Co., Ltd., 3, St. Bride's House, Salisbury Square, London, E.C.4.

Aeronautical Research Committee Reports and Memoranda: No. 1057.—On the Calculation of Stresses in the Hulls of Rigid Airships. By R. V. Southwell, F.R.S. November, 1926. H.M. Stationery Office, Kingsway, London, W.C.2. Price 1*s.* 9*d.* net.

Politique et Theories Monétaires Anglaises. By M. Lazard. Soc. Anon. du Recueil Sirey. 22, Rue Soufflot, Paris. Price 12 francs.

The Parachute "Salvator." S. A. Brevetti Aeronautici "Salvator," via in Lucina 15, Rome.

Report on the Progress of Civil Aviation (April 1, 1926-*December* 31, 1926). *Air Ministry—Directorate of Civil Aviation.* H.M. Stationery Office, Kingsway, London, W.C.2. Price 1*s.* 3*d.* net.

Catalogues

Wild-Barfield Small Electric Furnaces for Laboratories and Works. Automatic and Electric Furnaces, Ltd., 173-175, Farringdon Road, London, E.C.1.

Blackburn Aircraft.—The Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds.

Ball and Roller Bearings. Ransome and Marles Bearing Co., Ltd., Newark-on-Trent.

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AERONAUTICAL PATENT SPECIFICATIONS

(*Abbreviations*: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

APPLIED FOR IN 1925

Published May 19, 1927

31,818. M. L. BRAMSON. Fluid-pressure indicators. (269,613.)
32,578. A. H. EDWARDS. Aircraft. (269,620.)

APPLIED FOR IN 1926

Published May 19, 1927

3,540. F. L. WATSON. Aircraft. (251,532.)
7,524. W. LUBBECKE. Envelopes for aircraft. (249,542.)
11,834. C. HYDEN. Aeronautical Photography. (251,999.)

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